DAY 1

CONCEPT: SCHOOL, CLASSROOM AND LEARNING

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Understanding of NESP ● Understanding of present school processes of Afghanistan ● Knowledge of school timetable and academic calendar	**1.** Understand the different school processes contributing to learning **2.** Understand the importance of school in enabling learning 3. Understanding aims of schooling and its processes

Additional Readings for Trainer:

Reading References: The Stanford encyclopedia of philosophy. [https://plato.stanford.edu/entries/embodied-cognition/. Retrieved: 12th May 2021].

Star, Jon R., and Gabriel J. Stylianides. 2013. Procedural and Conceptual Knowledge: Exploring the Gap Between Knowledge Type and Knowledge Quality. Canadian Journal of Science, Mathematics, and Technology Education 13, no. 2:169-181 Link

For Reading Activity: National Education Strategic Plan 2017-21 (Page: 2,3,4,5) Link:

Day	Sub-topic	Concepts	Pedagogy	Time
Day 1	*Competency Developed:* Knowledge of pedagogy, Knowledge of NESP III, System and Strategic Thinking, Logical and critical conversation, Collaborating with Others			
	Introduction to the training + Orientation to the module for next 10 days	Concept 1: School, Classroom and Learning	Discussion: Brief about Pedagogy and Classroom Management Module What this module is offering?	20 mins
			Presentation of next 10 days module in sections, competencies and its objective	10 mins
			Outline of 10 days training plan	10 mins
			Activity 1: Ice breaker	40 mins
			Small Break	10 mins
			Discussion on understanding classroom processes enabling learning	40 mins
			Understanding importance of teacher in ensuring learning	40 mins
			Lunch	60 mins
			Activity 2: Watching the video and video-based reflection	40 min
			Understanding different educational activities conducted to ensure learning	40mins
			Small Break	10 mins

			Discussion on aims of schooling in present context	20 mins
			Activity 3: Articulating aims of schooling	40 mins
			Structured reflection for the day	20 mins

Introduction and overview of training

Materials needed: Projector and laptop to present ppt

After giving a trainer introduction, the trainer will have a brief discussion with the participants about the last module. After building the connection between the module, the trainer will explain GDAS competencies to be addressed in this training. Then will emphasize how these 10 days will contribute to their job role.

Activity 1: Ice breaker **(40 Mins)**

Materials needed: Flip Chart + Marker.

- The trainer will welcome all the participants in the workshop, and for the introduction, She/he will give instructions for an ice-breaking activity where different participants will be divided into small groups. Participants will introduce each other in the small group.
- Instruction to Participants: Participants will analyze their experiences of the world based on the indicators given below in the table. For example: if someone is listening to the radio, apart from just depending on their hearing senses, what percentage of other senses they can apply simultaneously to feel what they are listening to?
- To enable participation, the trainer can give her/his own example while watching a live cricket match, She/He mostly relies on visuals and focus less on audio or smell. After giving this example, the trainer will give 15 minutes to all groups to discuss.

- There will be no one correct answers. But individual differences are important. Through this activity, supervisors may also reflect on inclusion and how people with disabilities experience things.
- **Objective of this Activity**: To help learners engage with everyday actions at a deeper level by thinking through Senses as Concepts, applying them to different situations they already know.
- Instruction to participants; Estimation of what percentage of all the sensory information you receive comes through each sense. The trainer will show the activity table on the slide and ask groups to reflect on this.
- Instruction to participants; Estimation of what percentage of all the sensory information you receive comes through each sense

	sight	Hearing	Smell	Touch	Taste
Listening to a radio Show					
Watching a Television					
Walking on the Street					
Having Food					
Interacting in a group					

Playing football with Friends					

What is the concluding idea (Referring PPT): (Trainer will explain to the class)
It is very fascinating that What connects you to the external world? Not just about connecting to the external world. We are continuously creating meaning out of our experiences through our senses. Also, the experiences evolved over time and these evolved meanings give opportunities to learn new things. In a classroom setting, where we create learning opportunities for younger ones, we should design learning experiences more carefully.

Example: Imagine that we load a lot of educational videos on a laptop or maybe on a Television set, and ask a kid to watch. The kid will watch those videos. Definitely, he will watch and listen to that content. It is a passive way to engage with kids. We don't know what she is learning, what she is thinking. Even the kid is not able to interact with that video.

After a short break, We will talk about the classroom and Active Engagement.

----------Small Break----------

Topic of Discussion: Classroom
Purpose of this Session: Understanding Classroom Processes that enable learning.
Materials needed: Flip Chart + Marker

PPT What do our classroom stand for?

Trainer note: The Trainer will capture the response of the small group's views and support them in identifying different aspects of the classroom. For example, classroom stands for adult/ teacher to student/children learning, peer learning, power equation between teacher and students, subject and curriculum etc.

What is the concluding idea (Referring PPT):

- Learning from the **instruction provided** by teachers
- Learning from scaffolding provided by teacher
- Learning from the **question** posed by teacher
- **Learning from peers**
- Learning from the study **materials/TLMs** (**Textbook, Blackboard, Toys, Posters, Notebook etc**) provided

What is the role of the teacher in the socialisation process of the child?

Trainer note: Here the Trainer will try to gather participants to understand how the classroom facilitates children to express themselves in social settings, understand the social setting, and challenge socialisation norms such as discrimination of any kind so that participants do not see the classroom just as a platform for curriculum learning.

What is the concluding idea: Generally, the classroom is perceived as a platform to enable learning through curriculum facilitation. The teacher can provide different opportunities for students to learn beyond the textbook.

- Ensuring learning using the student background knowledge
- Ensuring learning using environment
- Ensuring learning from using different views of students

Activity 2:

Materials needed: Flip Chart + Marker + Laptop + audio System + Projector

Objective of this activity:

- Identify the various learning spaces that are carried out in schools with a purpose.
- Analyse the purpose of the various activities and their relevance in educating children.

The trainer will build a situation and ask the following questions to participants.

About this School: Imagine a School. Until a few years ago, students at the Shahid Khakrizwal Girls High School in Kandahar city, Afghanistan studied in tents. This changed in 2009 when the school started receiving support from the Education Quality Improvement Program, which built a two-story, 20-room building for the school, equipped it with teaching and learning aids, and trained the teachers.

Questions:

- Identify the various learning spaces that are carried out in schools with a purpose.
- Analyse the purpose of the various activities and their relevance in educating children.

Trainer note: The Trainer will support participants to identify different schooling activities in a day such as an assembly, recess break, sports activities, parent teachers meetings, examination, the celebration of festivals etc and how these different activities contribute to different purposes of schooling and educating children. The trainer may explain the following example.

Playing together in the playground contributes to..

- Supports in developing physical development of students
- Understanding rules and discipline of the games
- Coordination with each other
- Peer learning,

- Understanding failure and success
- Communication skills
- Respecting diversity

Trainer will ask participants to take any one example mentioned below and discuss in their respective group. The responses of the group have to be recorded on a Chart paper.

_____ Space/Activity Contributes to

Learning Spaces Like Library, Science Lab, Staff room, ICT Lab etc.

Activities like Preparing Timetable, Taking Attendance, Assembly, Parent-Teacher Meeting, Other Activities to reduce Dropouts, Textbook, Student Absenteeism, Asset Management & cleanliness of School, Lesson Plan making etc.

What is the concluding idea:
(Trainer will explain to the class)

It is important to understand how space, time, and academic/nonacademic activities play together in a school. In a school, there are both seen and unseen. Understanding the connection, coming up with a solution, testing that idea, documenting the process, discussing with key stakeholders, and prescribing the solution are the key takeaways of this activity.

It is also important to understand that only space, time and academic/non academic process influence learning at school. There are other Major factors that influence how much and how well we learn at school.

Prior Knowledge: General and specific abilities greatly influence learning, but how much a learner already knows about what he or she is being taught also strongly affects learning. Prior knowledge helps the learner acquire additional knowledge or skills more rapidly.

Motivation in Teaching Learning: We often talk about motivation and its importance, but what is it? There is a long list that we can discuss and reflect on. But in a School Setting, Motivation appears to be affected by three major factors: value, confidence, and mood.

- **Value to learn the subject:** The more we value something, the more motivated we are about it. If you value being seen as someone who likes Mathematics, you will become more inspired (that is, motivated) to learn about it. The higher the value attributed to what is to be learned, the greater the motivation.
- **Confidence in the classroom:** The optimal point of motivation is where the learner has enough confidence to feel she or he can learn, Understand the concept, and solve the problem, Things like rewards, Prizes, Punishment, Humiliation, relationships between Teachers-Students, Feedbacks affect mood. A conducive learning environment would enable teachers to better manage, motivate and engage their charges.
- **Mood**: Personal feelings affect our mood as does the atmosphere of the learning and working environment. A positive learning environment tends to improve a person's mood and, hence, his or her motivation.

- X

----------Small Break----------

Discussion and reflection: Discussion on aims of Schooling

In the previous session We learnt about the school, classroom, and learning. Also tried to understand how other learning spaces like the playground, library, and Science Labs help a child to grow. Now, let's try to understand what **Afghanistan Education Ministry's National Education Strategic Plan 2017-21** tells us about common goals for education.

Here the trainer will give the one page to be read out by participants from **Afghanistan Education Ministry's National Education Strategic Plan 2017-21**. The trainer will give participants 20 minutes to read the document and understand the goals from the document. After the goals are read by the participants, the trainer will ask participants to have a discussion and reflection within the group on

- What do they understand from the goal statement?
- How do they see their role in ensuring this goal fulfillment as supervisors?

The common Goal of the Strategic Plan is *to prepare skilled and competent citizens through the education system to sustain Afghanistan's socioeconomic development and social cohesion*. : -National Education Strategic Plan 2017-21 PP 2

The Strategic Plan is presented in three main sections:

1) Quality and relevance; 2) Equitable access, and 3) Efficient and transparent management.

Activity 3: Reading Activity

Objective of the Activity: Through this activity, Participants will read the NESP III Goal and draw out their role in ensuring the national goal.

National Education Strategic Plan 2017-21 (Page: 2,3,4,5)

Materials needed: Flip Chart + Marker and Prints Copies of NESP III

Trainer Note:

- Trainer will distribute the copies to all groups. It is recommended that all participants will get one copy of the suggested reading.
- Participants will read the document and discuss it in their respective groups.

What is the concluding idea:
(Trainer will explain to the class)

To achieve national goals, The objectives are clear. We all are part of the implementation process to achieve it. The following provides a summary of six areas of focus for **quality improvement**:

1. Develop the **relevance of the curriculum**, to provide learners with **appropriate social values and the skills needed** to put knowledge to practical personal use as well as for the community, society and the nation
2. Preparation and deployment of **professional teachers through a competency-based training programme**, a system for support with quality assurance, and flexible deployment models
3. Preparation and deployment of school administrators including **principals trained in leadership roles in management**, administration, school improvement and supervision of teachers
4. **Creation of a school and classroom environment that is safe (physically and psychologically), healthy, non-discriminatory, inclusive and child-friendly**
   (It is expected that the Facilitator hold the discussion around inclusive education at this point)
5. **Teacher professional development** to ensure continuous improvement in **instruction quality** in government, private and community schools. Revision of the policy for teacher evaluation linked to promotion and official teaching credentials through the national credentialing program
6. **Routine objective assessment of student learning outcomes in country**

Activity 4: Structured reflection of the day

Structured reflection (25 mins + 10 mins)
The participants will end the day with the structured reflection session. The trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.
All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.
It is up to the trainers' discretion on how they want to proceed.
To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and trainees get to actually comment on their training to make it their own.
Interactive diaries Material required: Any notebook and a pen.
The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as
1. What did you learn about in today's training?

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors. as references for further reading.

----------Day End----------

Day 2: Introduction To Learning Theories

CONCEPT: Learning Theories

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Understanding of Afghanistan Textbook and school curriculum ● Understanding of Learning theories and Applications	**1.** Understand the learning theories to approach active learning. **2.** Understand the importance of active learning in classroom Processes.

Day	**Sub-topic**	**Concepts**	**Pedagogy**	**Time**
Day 2	*Competency Developed:* Knowledge of pedagogy, Know Learning Theory, Applying Multiple Teaching Style and instructional strategies to engage students in the learning process			
	Introduction to Learning Theories		Recap: Day 1: Agency, Classroom rules, Active Learning	15 Mins
			Activity 1: Learner's Agency	90 Mins
			Short Break	10 Mins
			Activity 2: How children learn from more knowledgeable learners.	90 Mins
			Lunch Break	60 Mins

			Activity 3: Support children to discover their world and knowledge.	90 Mins
			Short Break	10 Mins
			Activity 4: Structured Reflection of the day	35 Mins

Notes for Trainer: To carry forward the momentum of the training, the Trainer will go through the recap of the previous day. It also helps the trainer to set the tone of the day.

RECAP:

The previous day, we learnt about the classroom, Learning and School processes. Also, we tried to understand why we need to be sensitive toward active learning methods to make the learning spaces more vibrant and joyful. While creating learning spaces we may consider processes, available time, TLM resources and activities. It will help us to engage more **meaningfully** with students as well as with the content.

In today's first session, we will try to understand how the Learner's Agency plays a crucial role in the process of teaching-learning. Also, We will check a few child development **Theories** that provide a basis to **understand** how a child **learns**. This is one way to explain, describe, analyze and predict **learning**. A **theory** helps us make more informed decisions about the curriculum design, lesson plan development and delivery of **classroom teaching-learning**. we will not devote time to behavioural learning. The selected theories are aimed at understanding active learning.

Small Group Activity 1: Learner's Agency

Objective: To engage participants on what factors contribute to an active learning environment where the student, as well as teacher's voice, is reflected in all aspects of the learning space.

Expected Output: Participants are expected to critically examine what enables students' participation in an authentic way to contribute to their own learning. (learning space, active learning pedagogy, Subject, Available time, process, inclusiveness, interactions, networking).

Activity: The trainer will circulate **classroom rules** (One page) to all groups. With reference to this document, small groups will discuss and bring factors to ensure active learning where the student's voice is reflected in all aspects of the learning space.

Tinkering Remark (Trainer to Participants): Ask participants to take an example, concepts like (Social Justice, Free Speech, Cultural Relativism, Sensitivity to Old People, etc. to reflect the above activity.

Resource Required: chart papers, Sketch Pens, notebooks, Pens

Trainer Lecturer Notes: Learner's Agency:

- Education is the process through which learners become capable of thinking independently which leads to autonomous action. A learner agency is when learners have **"the power to act"**. In a classroom context, Agency is when learning involves the activity and the initiative of the learner rather than responding to just inputs (instructions lead to passive learning) given by others.
- Students need to exercise agency, in their own education and throughout life. Agency implies a sense of responsibility to participate in the world and, in so doing, to influence people, events and circumstances for the better. Agency requires the ability to frame a guiding purpose and identify actions to achieve a goal.
- To help enable agency, educators must not only recognise learners' individuality but also acknowledge the wider set of relationships – with their teachers, peers, families and communities – that influence their learning.
- A concept underlying the learning framework is "co-agency" – the interactive, mutually supportive relationships that help learners to progress towards their valued goals. In this context, everyone should be considered a learner, not only students but also teachers,

school managers, parents and communities.

Two factors, in particular, help learners enable agency.

- learning environment that supports and motivates each student to nurture his or her passions, make connections between different learning experiences and opportunities, and design their own learning projects and processes in collaboration with others.

  How to ensure that all students are supported and valued?

Get to Know your Students

Getting to know your students can be difficult for teachers who see a lot of students every day. However, learning more about your pupils as individuals are essential for situations where there may be conflict and for building positive pupil/teacher relationships that will see individuals coming to you if they're struggling with anything academically or are having any other difficulties. At the start of the school year, get your pupils to introduce themselves and explain a few of their likes and dislikes. Alternatively, a personal essay can be submitted as homework if your lesson time is limited.

Listen to them

It may not always be apparent to the teacher staring at a classroom full of bored students, but pupils do come with certain expectations of you as a teacher, and therefore it is wise to engage with them every now and then and ask them for some constructive feedback for you. This will not only help you improve your methods, but will also invite the individuals in your class to assess how much they have learned, as well as affirm the trusting relationships you are trying to develop with your class.

Be Consistent

Children often judge an adult's character by their actions; therefore it is vital that you are consistent in how you treat your students.

Reward and Encourage Them

Learning the difference between praise and encouragement is key to rewarding your students effectively. Praise places a value judgment on the end result, for example, a teacher who praises might say that an essay was 'excellent' – which it may well be. However, pupils who consistently hear value judgments placed on their work may start to 'crave' praising statements and may feel discouraged when the teacher doesn't say that a particular piece of work is 'great.' Encouraging statements on the other hand acknowledge the efforts that the student put towards writing that excellent essay, and therefore the teacher might say something along the lines of, 'I can see that you conducted a lot of research for this topic.

There are three things that are core features of understanding learner agency.

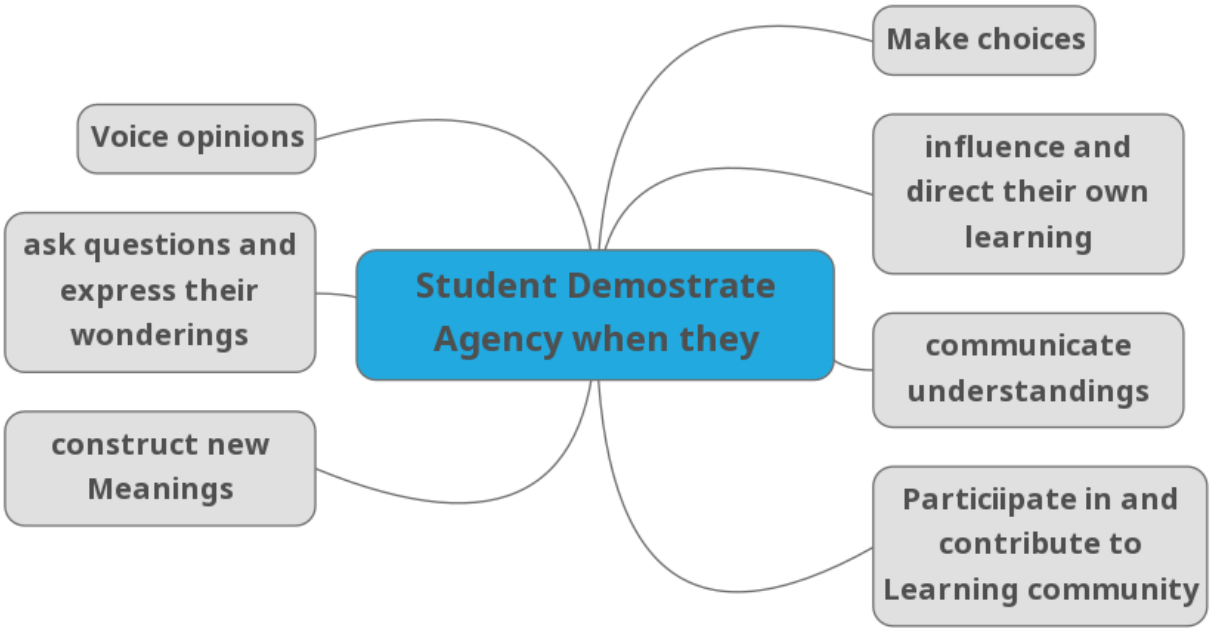
- Agency involves the initiative or self-regulation of the learner. Before a learner can exercise agency in their particular learning context they must have a belief that their behaviour and their approach to learning is actually going to make a difference for them in the learning in that setting.
- Second, agency is interdependent. It's not just about a learner in isolation doing their own thing and what suits them. Learners must develop an awareness that there are cause-effect relationships between the decisions they make and the actions they take.
- Thirdly, the agency includes an awareness of the responsibility of one's own actions on the environment and on others. So there's a social connectedness kind of dimension to that.

As we think about how our schools are going to be places that will prepare kids for life; skills and knowledge and innovative approaches, we need to be encouraging them to be agentic in their learning, because that's what they are going to need to be able to do beyond the school of course - in work, and as citizens.

Small group Presentation: Small groups will present their summary discussion to the whole class. (Presentation 5 Mins + Q&A 5 Mins)

- After the Presentation of groups, Trainer will facilitate a Question Answer Session. Other groups are welcome to ask questions to the presenter. If Q & A exceeds the time, the Trainer may ask the Participants to discuss it during breaks.

Concluding Discussion (Trainer to the whole class): We need to consider how that is reflected in the day-to-day decisions that are made around school - not simply in order to satisfy ourselves that we've heard what students have to say, but in more engaged and authentic ways that are about their learning. It is critical to consider the pedagogical approaches that are adopted by teachers and schools, and to question and challenge those that are not student-centric, with an emphasis on delivery and curriculum coverage. Learner agency will develop when learners are involved in the whole learning process - including decisions about the curriculum itself, involving learners a lot more in the choices about the what as well as the how and the why of what is being learned.



Additional Reading for Trainer:

https://plato.stanford.edu/entries/agency/

https://www.oecd.org/education/2030/E2030%20Position%20Paper%20(05.04.2018).pdf

**********Short Break**********

In the next session we will learn Learning theory; the works of Piaget and Vygotsky. They suggested that learners were not simply empty vessels into which a teacher "poured" knowledge. Their work suggested that even young children were capable of constructing their own knowledge of how the world works around them. Learning theory must be able to explain and predict observations.

Education is a discipline in which a theory can be used to explain observations as there are so many factors outside of the classroom that can affect a student's learning. Having a theory of how learning occurs is crucial for a teacher and for formulating their approach to teaching, So one does expect to (a) Design Learning for students; (b) measure the effectiveness of the Teaching approach and procedures.

There are many learning theories to read and understand, but in the next two sessions, we will try to understand Piaget and Vygotsky's work.

Small Group Activity 2:

Objective of the Activity: To Explain the process of learning through social interaction as being in the Zone of Proximal Development (ZPD) in Classroom.

Resource Required: Laptop, chart papers, Sketch Pens

Readings: Woolfolk, Anita. (2004). *Educational Psychology*. (9th ed). Boston: Allyn and Bacon.

How to conduct the Activity:

- Trainer will ask the participants to read the shot notes (material cited above)
- Explain the Theory and its usage to the participants.
- Facilitator will show the site (Or Quote Examples from the site) to demonstrate more examples from the surroundings. Here is the Link: https://sites.google.com/site/qim501eiddmockingjay/discussion
- **Activity (Small group):** Suppose, we have observed that few students are able to perform simple addition independently, and few could do it with the support of the teacher. Some of the students were not able to perform the same task at home while working alone. If this scenario is prevalent in our classroom, what strategies would you suggest to teachers while observing the class and its student as a supervisor?
- After the group discussion, the Trainer will ask one person from each group to summarize their small group discussion.

Concluding discussion: (Trainer explaining to Participants)

- Children learn and create knowledge through social interaction.
- A student has the capacity to learn any task but provided appropriate assistance, the student can learn a certain skill in a particular period of

time.

- Zone of proximal development is the difference between what a learner can do without help and what he or she can achieve with guidance and encouragement from a skilled partner or adult.

The zone of proximal development had a huge implication in teaching and pedagogy where he also defined the concept of scaffolding to describe the teacher's role in engaging with students in providing them support through demonstration or instruction.

The principles underpinning scaffolding are:

- Build interest in the subject and engage with people.
- Break the given task into smaller sub-tasks,
- Keep the individual or group focused on completing the sub-tasks but don't allow them to lose sight of the main task.
- Model possible ways of completing the task, which individuals can imitate and then eventually internalise.

ZPD is one aspect of scaffolding that can be achieved by:

- Test learners' prior knowledge of the subject. (what kids know about addition, is there any misconception: identify)
- Identify the kid who understood the concept and those who are still struggling.
- Form Small groups and facilitate group discussion around addiction. Ensure that kids get proper assistance from other learners who know it.

Small Group Activity 3: Objective of the Activity: To Explain the process of learning through stages of development, So participants can analyze classroom learning.

Resource Required: Laptop, Audio System, chart papers, Sketch Pens.

Readings: Woolfolk, Anita. (2004). *Educational Psychology*. (9th ed). Boston: Allyn and Bacon.

How to conduct the Activity:

- Trainer will ask the participants to refer to the above reading material.
- Explain the Theory and its usage to the participants.
- The explanation of the video shown will pose these questions for further discussion towards developmental Stage Theory.

Small Group Activity: (15 Mins)

Suppose, you are observing the following science classroom (**Blackboard teaching/Grade 9/concrete operational stage**). After the teacher teaches the concept of Heat,

T: Is metal colder than Plastic/Wood? Imagine, a metal spoon, a wooden spoon and a plastic spoon are placed in hot water for half a day. The water is maintained at the same temperature throughout. At the end of the experiment, all spoons are taken out and the temperature is measured. In a 40-50 minutes class, it is not possible to engage with a half-day-long experiment. What are the **strategies and questions teachers should ask in a classroom**?

Notes for Trainer:

- Trainer will ask the Questions to participants.

- Ask them to discuss this in their small groups.
- After discussion one person from each group will summarize the small group discussion.

Concluding Discussion: (Trainer explain to participants)

In classrooms, the construction of knowledge is based on the individual's experiences.

- People react differently to learning according to their stage of cognitive development.
- Teachers should take an active, mentoring role towards their learners.
- Learners should be encouraged to learn from their mistakes.
- The focus should be on the process of learning as well as the outcome.
- Teachers should respect each learner's interests, abilities, and limits.

Here are some tips on how to apply Piaget's theory:

- People may react differently to learning, not as a result of their age, but according to the stage they are at in their cognitive development.
- Some learners will flourish in group work whereas others may need more one-on-one support.
- Try to balance your time so that you can cater for all of your learners' needs.
- Encourage your learners to learn from each other and emphasise that everyone will have something to offer in this respect.

Convince them that failing at something doesn't mean they are a failure; simply that they have failed a task. The important thing is to get learners to learn from their mistakes. Congratulate your learners on their efforts as well as their achievements.

Story: The following blog can be incorporated into this session. (If time allows) https://www.nelsonmandela.org/content/page/biography

In the Classroom: Try to get an understanding of what stage in their cognitive development your learners are at. Acknowledge effort as well as

achievement. Trigger Questions Like

- How would you test if your response is correct?
- Just think, if we keep a steel spoon, which spoon will be the hottest?
- If I keep the spoon on ice, Would your answer change? Which one is the coldest?

Activity 4: Structured reflection of the day

Structured reflection (25 mins + 10 mins)

- The participants will end the day with the structured reflection session. The trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. ensuring that everyone gets time to share in their groups.

- All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.

- To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and trainees get to actually comment on their training to make it their own. Interactive diaries

- Material required: Any notebook and a pen. The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as,
  What did you learn about in today's training?
  How learning theories will help them in their observation skills?
- Participants will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back.

******* Day 2 Ends Here**********

Day 3
Curriculum subject: Pedagogy of Language

Required trainer skill set:	**Expected Outcome:**
● **Familiar with Language Pedagogy** ● **Multilingualism** ● **Understanding of diversity in language learning**	1. Understanding the nature of learning language and its implication in classroom teaching of language. 2. Supervisors will understand the key attributes of a language learning classroom.

Additional Reading:

Kumar, K. (1986). kkThe Child's Language And The Teacher.

Day	Sub-topic	Concepts	Pedagogy	Time
Day 3	Competency developed: Language learning process and pedagogical considerations			
	Pedagogy of language	Nature of language learning process	Recap: Previous day recap	10 min
			Activity 1: discussion on understanding language learning process of humans	90 min
			Small break	10 min
			Discussion on nature of language learning and its implication on classroom teaching of language learning	60 min
			Important aspect of language learning to be focussed in classroom learning	40 min
			Lunch	60 min
			Activity 2: Understanding the key takeaways for Supervisors in language classroom	60 min
			Small Break	10 min
			Activity 3: Reflection on language teachers positioning in schooling	30 mins
			Activity 4: Structured reflection for the day	35 mins

Activity 1: (90 min)

Objective of the Activity: To develop an understanding of what learning language objectives are.
Output: Participants will be able to articulate their understanding of learning the language.

Reading: Curtiss, S. (2014). ***Genie: a psycholinguistic study of a modern-day wild child*****. Academic Press.**

(20 Mins)
To support participants in understanding the question, the Trainer can share a brief synopsis of the video
About the Reading:
" French feral child who was found at around 12, and the doctors could only assume his age at the time). Upon his discovery, he was given to many people to stay with, running away from civilisation approximately eight times. Eventually, his case was taken up by a young physician, Jean Marc Gaspard Itard, who worked with the boy for five years and gave him his name, Victor. Itard was interested in determining what Victor could learn. He devised procedures to teach the boy words and recorded his progress. Based on his work with Victor, Itard broke new ground in the education of the developmentally delayed".

Note for Trainer: The Trainer will ask the participants to read the short paper (only prescribed 20 Mins). It is prescribed for only 20 Mins due to time constraints. Participants will discuss in their respective small groups

What do they have understood about the learning process of child Victor?

Before participants start discussing, the Trainer will ask the following tinkering questions for meaningful group discussion: ,

- What Steps that teachers took to create a language learning environment for Victor.

After posing the above question, the Trainer will then ask participants to make connections of what they have learned from Piaget development theorist and Vygostky as well. The Trainer then will try to support participants in establishing the connection between child learning and the need for a conducive social and cognitive stimulating environment. Also Participants may connect Strategies to use language outside schools. (Homework, Projects, Mock Interviews, Sports commentary etc.)

Concluding Discussion: The key message here to establish are:

- Humans have natural cognitive ability to learn but learning varies on the exposure of social interaction and cognition.
- Creating a conducive learning environment is important for language development. Let's think if Victor will not meet Dr. Jean Then?
- Availability of a wide variety of social interaction, text materials, opportunity to read and ask questions, peer discussions are some of the factors not just for language learning but learning and development overall.
- As understood in the previous session, while discussing the Zone of Proximal Development, a child can learn on its own to an extent. Therefore, adult and peer support and interaction enable children to learn socially as well cognitively in any skills. In this video also, Dr. Jean helped Victor to learn language,even though he passed the development stage already.

Discussion on nature of language learning and its implication on classroom teaching of language learning
(60 Mins)

To understand “language learning” in the schooling scenario, here are the four critical aspects that the Trainer needs to discuss to sensitise participants toward the importance of language learning in schooling. There are

- Understanding the nature of language learning
- Understanding the importance of deliberate instruction for language learning
- Critical consideration for language learning from a pedagogical context
- How language learning is critical for learning every other curricular subject.

Trainer Note:

The Trainer poses the question for a larger group for discussion “what are the essential qualities/prerequisites humans have to learn the language which is not present in other beings? After posing this question, the Trainer has a guided discussion with the participants by gathering responses on “what makes humans extremely unique in terms of learning a language”. In this discussion, the Trainer will try to build participants' understanding of the natural disposition of humans for learning language, for example, vocal code which helps people to produce diverse sounds and communicate.

Having a discussion between the participants, the Trainer then tries to establish how language learning is inherently natural to human beings. The Trainer then also explains some of the theoretical references by explaining Chomsky Language Acquisition Device etc.

Once explaining and giving the theoretical explanation of language acquisition the Trainer can move to the second subsection by posing questions to participants if all humans are naturally wired to learn a language then why are they taught in schools?

Gathering responses from the participants, the Trainer will try to establish key aspects of language learning in schools:

- Even though humans learn language naturally from their social interaction, it is only the oral language which develops naturally through observation and mere interaction.
- Written language or learning language script in written form is not a natural phenomenon, it is always learnt through deliberate instructions whether at home or in schools.

This is important to establish for the teacher and the role of the supervisor because:

- The awareness that there is an innate language faculty has two important pedagogical consequences: given adequate exposure, children will acquire new languages with ease; and the focus in teaching should be more on meaning than grammar.

The Trainer then can discuss how in the Afghanistan context; language learning takes place whether in Madarsa or in formal schooling. The Trainer can draw a pattern of how similar and dissimilar it is to emphasize that every instruction and pedagogical choice plays an important role in language learning thus, language learning in written form is an extremely deliberate process. For example: In Afghanistan, Dari and Pasto are the most widely spoken languages but teaching one of the languages in one of the provinces having both speakers is a deliberate policy decision.

After establishing language learning as a deliberate process, the Trainer will try to discuss with participants and gather their responses on "what are the objectives of language learning in schooling". Participants' responses will vary depending on their context, understanding and knowledge of the language and its objective. From this discussion, the Trainer will try to emphasise these key messages:

- Students come to school with developed systemic knowledge of an oral language which needs to be enriched (Activities like Like Word games. Expand your children's vocabulary with word games, Jokes foster good humour and creativity in children, Riddles, Rhymes, Homonyms, Storytelling, Songs, and Tongue twisters) are rather restricted in the classroom learning of the language.
- Language learning in written form is critical for language development but oral language development is equally important which helps students to understand their worldview around them, and use and expand their contextual information. Therefore, in schooling, and in language learning classrooms, **it is extremely critical that teachers not just focus on developing the skills of written language but also consider and give importance in their classroom practices to understanding and expanding students' views and developing their oral language as well.**

  Few Strategies to develop oral language like
- **Encourage conversation. ...**

❖ Model syntactic structure. ...

- ❖ Maintain eye contact. ...
- ❖ Remind students to speak loudly and articulate clearly. ...
- ❖ Explain the subtleties of tone. ...
- ❖ Attend to listening skills. ...
- ❖ Incorporate a “question of the day.”

- **Teachers also have to understand that different student has different learning curves depending on their background as well as exposure to te**xt. Therefore, supporting children in learning language is extremely critical, especially for those who come from multi-lingual scenarios and have two different language exposure at home as well as medium of instruction.
- It is extremely important for teachers to focus on grammar while teaching the written form of the language, but it is also equally critical for teachers to give time and provide support for students to practice these skills while reading. The importance of reading habits and developing language skills from reading is well established in research as well.

Once these key messages were presented by the trainer and discussed, the trainer will request all the participants' supervisors to identify what are the key takeaways they have taken from the discussion for ensuring learning in the language classroom. After the brief discussion, the trainer can establish key actionable for the supervisor:

After establishing these critical points, to understand important aspects of language learning, the trainer will have a discussion by posing questions and guided by ppt

- **How Language can be used as a tool of integration?**

The trainer should address how a teacher does not just need to empathise with students having different languages spoken at their home, but as a teacher they need to integrate these languages and students' knowledge into the classroom conversation. In language-aware education, the responsibility for pupils’ language development is shared across the school and community. The classroom plays an important role in supporting the heritage of languages as well as the value of plurilingualism.

Language which can be used as an effective instrument for national development and the promotion of national consciousness and unity can also be used as a tool for marginalization in multilingual and multi-ethnicity societies like Afghanistan. In a School space Activities like Debate

on issues related to local importance, Folk Stories Telling, Exposure to good stories around school, and skills like Patiently listening to others (on various platforms like community meetings, TV Shows, Radio Shows etc) can be promoted beyond the language classroom.

- **How is the language different in school from home?**

The trainer will connect it with previous discussions where the nature of language was discussed. As an extension of the nature of the language spoken at home and taught in the classroom, the trainer here will emphasise the "student-teacher" relationship. At home, the child observes the interaction multiple times and organically absorbs language rules and meaning, but in the classroom, the teacher needs to emphasise the importance of questioning where students confidently ask questions to the teacher about what they do not know.

Secondly, at school, to standardise the curriculum, a language largely remains abstract with a selected set of poems, and stories which are very different from the day-to-day language used at home. The teacher plays an important role in connecting what the child knows to the decontextualized world created in the textbook.

Thirdly, the school always struggles to recognise the rich history of language development at home. This mismatch needs to be addressed by the language teacher where knowledge of the student needs to be leveraged by the teacher rather than being discouraged from sharing in the class.

- **What are the different capacities to be developed in a language learning classroom?**

While most language classrooms focus on developing grammatical ability/literacy skills in the classroom. The overall emphasis of the language classroom is to develop different abilities which enable students to perform different functions of the language. For example

★ **Language classrooms should create enough opportunities for students to talk and speak**- When young people are trying out ideas and modifying them as they speak, it is to be expected that their delivery will be hesitant, broken, and full of dead-ends and changes of direction. This makes their learning talk very different from a well-shaped presentation…". As pupils use spoken language, they can 'trial' different understandings and forms of language.

★ **Language classrooms should also create opportunities to enable students to better listen**- Listening is also a public affair. Within the *cultural* context of the classroom, pupils are expected to learn to listen from their early days in school as a sign of respect for teacher and peers, as well as means to access important information. This cultural activity is, therefore, also *cognitive* in that pupils should discern what is important in what is said and be able to remember what is relevant in order to participate in different activities and to build understanding. By listening to others it is hoped that pupils have the opportunity to see and learn from different perspectives.

★ **Language classrooms should also create opportunities to enable students to be readers:** Reading is a highly *cultural* activity from the sign system (letters, syllables, characters), the direction of reading and the role of the printed word. The language classroom should not only build the ability to read but also create structural activities to develop the reading habit of the students.

★ **Language classrooms should also create opportunities to be expressive in writing:** Mostly classroom language learning in the context of writing is "focused on skills-based writing" for example learning to spell, learning to write perfect sentences etc. But the writing ability of students should not limit to skill-based writing, but also focus on expressive writing as well. The activities mentioned below can be part of the classroom teaching-learning process.

- Dictation.
- Story Rewriting. The teacher reads a story or the class listens to an audio story. ...
- Visualization. ...
- Pop Song Rewrite. ...
- Short videos. ...
- Newscasts / Weather reports. ...
- Travel Videos. ...
- Pictures / Slideshows.

Small Group Activity 2: The trainer will divide the participants into small groups and ask them to reflect on key understanding from the day session and identify the key takeaways from "what language classroom should look like?''

Objective: The participants will understand the key attributes which enable a language learning process more constructive and learner-centric.

Output: The participants can identify the key takeaways to be ensured in the language learning classroom.

The trainer can give some questions which will support supervisors to reflect on the classroom scenario. For example:

- In a language classroom, what is the importance of students allowing students to speak?
- In a language classroom, how will you ensure that teachers just not restrict learners to learn only literary skills but also make efforts in enabling students to express themselves?
- In a language classroom how as a supervisor how will you ensure that students not develop reading skill but also develops reading habit?

After giving 15 minutes for small group discussion, all the supervisors will present their understanding of the changes they want to see in the classroom and present it to a large group presentation.

Concluding Discussion:

- Most of us are so used to defining language as a means of communication that we often forget its usefulness as a means to **think, feel, and react to things**. This wider use of language is extremely important for people (You, me, Teacher, School Head or Parents) who want to work with young children, for in childhood language plays a formative role in the development of the child's personality and abilities. It acts as a subtle, yet strong, force, shaping the child's perception of the world, interests, capabilities, and even values and attitudes.
- In a classroom, the job of the Language teacher is fairly clear. She/He must create an environment which permits children to make continuous attempts to link the use of language with life's experiences and objects.

(Example: Primary Grade: This can be done by ensuring that children bring to school a variety of objects (such as leaves, stones, feathers, twigs, and broken things) that children are asked to talk, write and read about the experiences they have had outside the school)

Example: Children are taken out of the classroom to see the world around the school so they can inspect ordinary objects carefully (objects such as a broken bridge, a mosque, Market, Sports Ground, Library etc) and talk about them. Such study visits in the school's immediate neighbourhood can provide valuable resources for language learning.

Small Group Activity 3: Understanding the positioning of language classrooms in the subject hierarchy.

Objective: The participant will reflect on the "positioning of the language classroom" in the schooling process.

Outcome: Based on the reflection, the participants can identify the importance of language classrooms and identify the steps to ensure it.

Procedure:

- The Trainer will ask all the participants to remember their favourite teachers from their schooling and why they were favourites they have to write it down on a paper.
- To do this reflection, the Trainer will give participants 15 minutes. After 15 minutes, the Trainer will listen to participants' responses and draw patterns of these teachers, their taught subjects and their pedagogical patterns.

Discussion: The Trainer will emphatically listen to all responses and try to draw a pattern on "how many participants have taken their language teacher's name?" If the majority have taken language teachers' names, then it is well established that language learning is critical in their life. If the majority of participants have not taken language teachers' names, then

Trainer can put further questions for reflection which are:

- How many of us even now consider language learning to be critical for schooling? If yes, why less priority and resources are given to language learning?
- Even though we consider language learning critical for academic achievement, then why is it not considered desirable in our schooling?
- Even though language learning in schooling is sufficient for making us literate and learning other subjects, whether it is sufficient for creating a lifelong learner and knowing different perspectives?

Concluding Discussion:

Following up the discussion on these three-pointers, the Trainer can consolidate the discussion by giving a brief synopsis of what all we have discussed so far in the session and how important it is to have deliberate language learning instruction in schooling which enable students to be lifelong reader rather just fulfilling the purpose of literacy.

Activity 4: Structured reflection of the day

Structured reflection (25 mins + 10 mins)

- The participants will end the day with the structured reflection session. The trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.

- All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision science and Allied field, and how best they can be used to improve on them.

- It is up to the trainer's discretion on how they want to proceed. To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. The interactive diary is a strategy to include the supervisors' voices in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer.

- Interactive diaries Material required: Any notebook and a pen. The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as. What did you learn about in today's training?

- Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors. as references for further reading.

******* Day 3 Ends Here**********

Additional Readings for Facilitator (and Teachers as well)

Okal, B. O. (2014). Benefits of Multilingualism in Education Link

Heugh, K., French, M., Armitage, J., Taylor-Leech, K., Billinghurst, N., & Ollerhead, S. (2019). Using multilingual approaches: moving from theory to practice. Link

DAY 4

Pedagogy of Mathematics

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Understanding of Maths curriculum and Textbook	After going through this unit, Participants will be able to ● Understand aims of teaching and learning mathematics education. ● Identify the indicators of effective mathematics education. ● Create a conducive learning environment in the school for Mathematization.

Day	Sub-topic	Concepts	Pedagogy	Time
Day 4	*Competency Developed:* Knowledge of pedagogy, Applying Multiple Teaching Style and instructional strategies to engage student in learning process			
	Pedagogy of Mathematics		Activity 1: Why Mathematics?	90 Mins
			Break	10 Mins
			Activity 2: Understanding the usages of different materials and tools which can be used to solve mathematical problems.	90 Mins
			Lunch Break	60 Mins
			Activity 3: Structure discussion around Maths education	70 Mins
			Break	10 Mins
			Activity 4: Structured reflection	60 Mins

Activity 1: Why Mathematics?

Objective: Identify the indicators of effective mathematics education.
Output: Participants will be able to understand key indicators for learning mathematic**s.**
Resource Required: Computer, Notebook, Pens, Chatpapers, Sketch Pens

Procedures:

Step 1: The trainer will ask the following Questions to the entire class for initiating the discussion. Questions are

- Which are the areas and everyday works where mathematics holds a key position.
- Why do you think that children should learn Mathematics?

Step 2: The trainer will ask participants to discuss in their respective small groups, then write down their answers on chart papers.

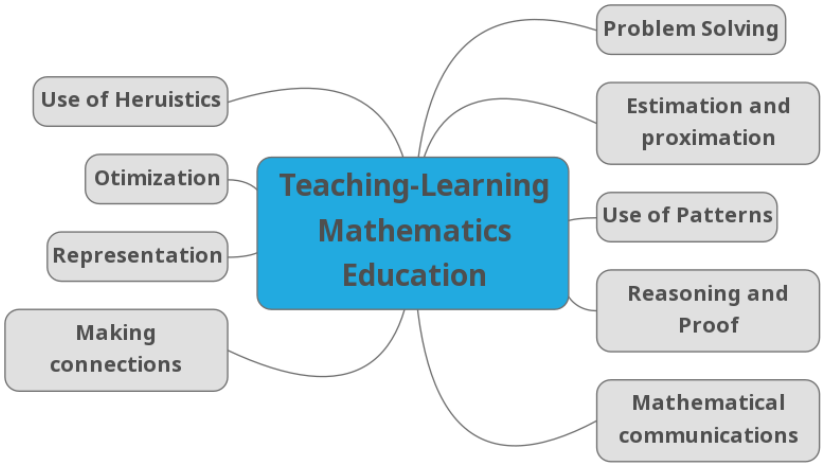
Step 3: The trainer will explain the Lecturer's notes and conclude the session. While discussing the concepts, Participation from learners will be welcome. It helps in bringing new relevant examples.

Lecture Notes:

In general, mathematics refers to the application of concepts, procedures and methods developed in mathematics. Developing the ability of mathematization which is regarded as constituting the higher aims of mathematics, includes developing such abilities as problem-solving, use of heuristics, estimation and approximation, optimisation, use of patterns, visualization, representation, reasoning and proof, making

connections, mathematical communication including developing aesthetic feeling.

Concluding Discussion:



- **Problem Solving:** The problem solving skills include skills of observation, experimentation, estimation, reasoning and verification. Example: How can we measure the length of a classroom? Students may utilise their experience of measuring a table and can use fingers, foot, hand, stick, rope, measuring tape etc. After some trials, students may use a measuring tape when they are asked to measure a long space. When children learn a variety of approaches their toolkit gets richer experiences. While solving these mathematical problems in the classroom, the student may just understand it as a task to be done. Here it is important for the teacher and supervisors supporting teaching to relate these mathematical problems to daily life. This enables them to understand that they

can apply their mathematical learning in problem-solving.

- **Use of Heuristics:** It is generally believed that mathematics is considered to be 'exact' where one uses 'the appropriate formula'. But one can use alternative processes and interactive methods to solve a problem. This encourages the learner to try different hunches for solving the problems. Example: There are 10 students in the classroom. Students will shake hands with each other. How many total handshakes? There are multiple ways that we can solve this puzzle. a. calculating one by one 2. Taking a relatively small number and trialling it. 3. By using the theory of permutation. Therefore in a mathematical classroom, it is important for teachers to provide exposure to students so that students understand the problem and learn to solve it by applying the different methodologies.
- **Estimation and approximation:** In many cases, students use this skill to employ these approximations in solving more complex problems. School mathematics, therefore, can play a significant role in developing and refining such useful skills. Example: In a projectile motion (throwing a ball), concepts like angle, speed, distance travelled, Direction, Height etc were taught to students. Students in the classroom are merely responsible to answer the questions rather than asking questions. The teacher not only should focus on supporting them learn estimation and appropriation but also need to provide its application in life experiences as well.
- **Optimization:** means utilization of available conditions and resources to the fullest extent. While teaching loans and interest in a specific grade, the student may just learn how to solve compound interest and simple interest problems but it is up to the teacher. Example: Take an example of Economic reasoning/Finance Planning. Mr Iqbal's annual income is 3.5 lakhs Afghani. He wants to set up an automobile repair shop worth 15 lakhs again for his daughter. He would like to take a bank loan, how many years can he take out a loan to settle it? (It depends on the Age of the borrower, Savings Mr Iqbal has, Installment Calculation, compound interest etc.)
- **Reasoning and Proof:** The process of reasoning and proof is important in mathematics. The aim should be to encourage proof as a systematic way of argumentation, evaluate arguments, make and investigate and understand that there are various methods of reasoning. Example: What next?
  0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89

- **Use of patterns:** Study of patterns requires students to recognize, describe, and generalize patterns (events, shapes, designs, sets of numbers) to arrive at rules and formulae.

Example: Doors/Window Design

Activity 2: Understanding the usage of different materials and tools which can be used to solve mathematical problems.
Objective: To provide participants with opportunities to understand mathematical concepts through material design.
Output: To develop a prototype to understand mathematical concepts.
Resource Required: A4 Sheet Papers, Scissors, Whiteboard, PPT & Computers

Procedures:

- Step 1: Trainer reference instruction:
    - (Trainer will Practice before facilitation)

- Step 2: Instruction to participants: The trainer will ask the participants in the small groups "How they can pass through an A4 Sheet Paper"
- Step 3: After distributing A4 Sheets to all groups, it is expected that a small group will discuss within group members and come up with a solution.
- Step 4: There will be three kinds of group engagements. a. Some groups will solve the puzzle fast b. Some of them will have different guesses c. Few of them will not be able to understand the problem.
- Step 5: Here are the trigger Questions that might help groups to solve the challenge. How we can cut to expand the area of the paper?
- Step 6: The trainer will demonstrate the exercise.

Concluding Discussion:

- Manipulative materials are objects or things that the learner is able to feel, touch, handle, and move. They may be real objects which have social applications in our everyday life. In the above exercise, we use A4 Sheet Paper. There are many such objects available which can be used to demonstrate mathematical concepts. Example: Matchsticks, broken Tiles, clothes, straws, weighing scale etc. Here it is important to understand that learning mathematics is not restricted to solving textbook problems and secondly learning material for

construct knowledge experiences in a mathematical classroom is not always expensive.

- When a teacher tries to teach the concept of Area and Perimeter. A4 Sheet paper is given (**210 x 297 Millimeters**). So its perimeter will be 1014 millimetres. The size of paper is so small that it is not possible for a human to pass through it. So we need to cut the paper to expand its perimeter. Here, a simple A4 paper sheet not just provides an opportunity to solve the problem but also provides an opportunity by engaging students in a hands-on activity. After solving the problem, here it is important for the teacher to understand what kind of trigger question can make this exercise more meaningful. For example: Does cutting the paper help in increasing the area?
- For practice, the Trainer may ask the participant to Try other manipulative materials at Home: One material that can be used to teach a mathematical concept. Link to Hand-on Maths guide: https://www.arvindguptatoys.com/arvindgupta/e-hands-on-maths.pdf
- Other Resources that can be used in the classroom: https://www.arvindguptatoys.com/arvindgupta/paperfun-kenniwy.pdf

Activity 3: Structure discussion around maths education
Objective: To make participants understand the various methods of teaching mathematics.
Output: Participants can apply these methods to appreciate mathematics teaching.
Resource Required: Computer, Projector, Notebooks, Pens

Procedures:

Step 1: The trainer will ask the participants to go through the reading. (Teaching Multiplication Visual Approach)

Step 2: After the Reading, the Trainer will ask participants what they have understood from it. The trainer will write down the responses on the whiteboard.
A few Additional Questions might help the trainer to get more answers.

- Why do you think that this method is interesting?
- Do you think that learners will understand multiplication better through this process?
- Do you think that we may come out of rote learning by using such techniques?

Step 3: After completing the above step (which takes approx 10 Mins), Trainer will explain as follows.

- Let's not talk about teachers and their teaching. Discuss the techniques themselves to understand multiplication.
- It is tempting to appreciate such techniques. It seems that the entire class is engaged. In our everyday life, we observe different kinds of mathematical patterns that surprise us. Selection of those patterns can be part of the teaching-learning process that requires critical evaluation and thinking.
- In our concluding session, we will see a few methods of doing mathematics. It will help us to evaluate techniques that can be used in classroom practices.

Concluding Discussion:

The following are the few methods that We used to make the teaching-learning process of Mathematics effective.

- Inductive-Deductive Method

Inductive method is to move from specific examples to generalization and the deductive method is to move from generalization to specific examples. Things like Formulas, theorems, examples, and results are derived, proved and used. Let's take a few examples. Example 1: Prove that 5n+1 is an odd number. Where n is a natural number. Let's consider n=1, 2, 3, 4, 5. If we put the value of n in the above-mentioned equation, we get values 7, 11, 16, 21, and 26 respectively. It is clear that 5n+1 is not an odd number. This is an inductive reasoning process. We tested the different conditions, found the irregularities and then we generalised that the given unknown is not an odd number.

Deductive reasoning Example 2:

All numbers ending with either 0 or 5, are divisible by 5. To find out which of the following numbers is divisible by 5? (In Deductive reasoning, Generalisations are given/proved. We need to identify cases from the generalisation statement.

Option A: 1055 Option B: 100 Option C: 75 Option D: All of the above

- Analytic and Synthetic Method

Analytic is breaking down and moving from unknown to known and Synthetic is putting together known bits of information and moving from known to unknown.) These methods are basically used in proving the results and solving sums. In textbooks mostly synthetic methods are used, to prove something unknown. Trainers may ask them to check a few math textbooks to verify this.

Example: *if a/b=d/c then* Prove that *d(a-2ab) = b(c-2ad)*

Analytical Method	Synthetic Method
$a/b=d/c$ $\therefore b/a- 2a =d/c- 2a$ $\therefore d(a-2ab) = b(c-2ad)$	$d(a-2ab) = b(c-2ad)$ $\Leftrightarrow (a - 2ab)/b=(c - 2ad)/d$ $\Leftrightarrow b/a- 2a =d/c- 2a$ $\Leftrightarrow b/a=d/c$

- Problem Solving Method

Presenting the knowledge to be learnt in the form of a problem. It begins with a problematic situation and consists of continuous meaningful well-integrated activity. Example 1: Suppose there are 50 people in the classroom, and each of them will shake hands with each other. How many total handshakes will be there?

Note for Facilitator: It is an example of Arithmetic Progression.

1+2+3+.....+N=N*(N+1)/2 [Total handshakes will be 1+2+3+....49 = 49*(49+1)/2 = 1225

Laboratory Method: Learning by doing is one of the most effective ways to learn mathematical concepts. It helps learners to proceed from concrete to abstract.

- Let's Take an Example: Suppose the School is going to buy carpets for classrooms. How much carpet will be sufficient enough? To Find the Area of the classroom. A simple meter Tape is sufficient to demonstrate this exercise.
- Use of ICT is also helpful here. Try https://phet.colorado.edu/sims/html/area-model-introduction/latest/area-model-introduction_en.html

Activity 4: Structured reflection
Objective: To connect today's learning to their Job responsibility.
Output: To discuss, reflect and submit the answers in diarie**s.**
Resource Required: Notebook and pen

Procedures:

- Trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.
- All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect about the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.

Trainer Notes:
The participants will end the day with a structured reflection session. To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and trainees get to actually comment on their training to make it their own.

Activity: The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as

- How did ancient Mathematics contribute to modern-day life?
- How does Mathematics affect our daily lives? (While cooking: by using ingredients we use promotional reasoning, all kinds of transactions with the Bank, at the Market to buy groceries, Fruits etc.)
- Why are women underrepresented in Mathematics fields?
- Is there some new way in which the teacher can present a concept in order to make it more meaningful and more interesting?
- What activities, demonstrations, teaching aids, etc. would enrich the classroom presentation? (Take any textbook example)
- How can you support Maths teachers as part of your responsibility? (Your own preparation, Strategies with reference to National Goal)

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors.

******Day 4 Ends here***

DAY 5: Pedagogy of Science

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set: ● Familiar with Science Education ● Knowledgeable of science teaching, Experiments, use of ICT in teaching Practice	Objectives of the day are to help academic supervisors in: ● Understanding the nature of science and its place in school curriculum, ● Understanding the importance of scientific temper development among all learners. ● Discussion on various issues approaching gender in Science Education.

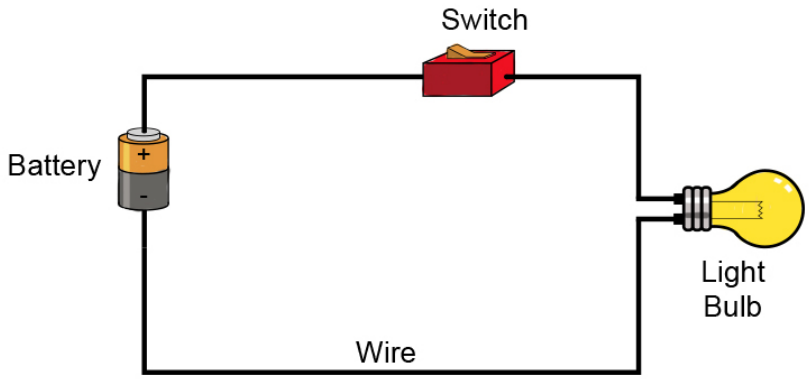
Day	Sub-topic	Concepts	Pedagogy	Time (Mins)
Day 5	*Competency Developed:* Knowledge of pedagogy, Applying Multiple Teaching Style and instructional strategies to engage student in learning process			
	Pedagogy of Science	Active Learning	Activity 1: **Scientific process**	120
			Break	10
			Activity 2: **Perspective: Science Education**	90
			Lunch	60
			Activity 3: **Science & Society**	90
			Break	10
			Activity 4: **Structured reflection of the day**	35

Notes for Trainer: The Trainer will divide the participants into their respective groups. In the first session of the day, the Trainer will conduct the activity first. The trainer will show the following activity slide to the class and ask them to discuss it in their groups. **Instruction to participants**: Discuss in your small group and Fill Yes/No/maybe in the appropriate place.

The objective of the Activity: identify basic scientific skills to be developed among learners.

Output: Participants will get familiar with scientific skills**.**

Small Group Activity: 1 (10 Mins)



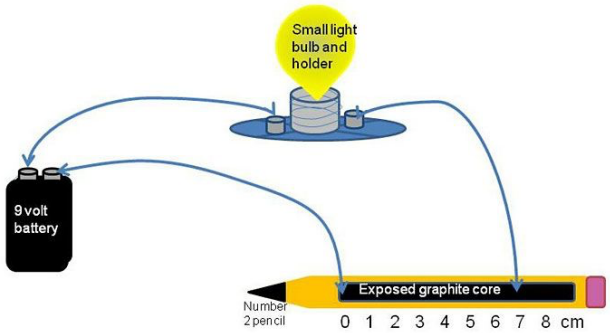
Electric Conductivity of Materials

SL No.	Wire Materials	Bulb Glows (Yes/No/Maybe)	Bulb Does not Glow (Yes/No/Maybe)
1	Iron		
2	Copper		
3	Aluminium		
4	Silver		
5	Gold		
6	Mercury		
7	Pencil Lead		
8	Graphite (Non-Metal)		

Notes for Trainer: Lecture Notes: Let us discuss the basic science process skills. (Let's consider the above Activity as an example).

- **Observation:** In the above example, we might have observed the wire's shape, colour, material, texture (**qualitative data**) and dimensions i.e. length, breadth & height, volume, and weight (**quantitative data**) while conducting the experiment. All this information is prior to knowing before conducting the experiment.
- **Classification:** Classification of objects (like **wire, bulb, battery, Switch**) is a process of identifying similarities, differences, and interrelationships. The classification process (Organising making meaning). Examples like: Taxonomy of living organisms, Acid-Base classification. In the above

example, we may classify all the wire materials used were metals/non-metals. From our classification process, we may generalise that metals are good conductors of electricity, but there are **exceptions** (graphite which is not a metal that conducts electricity).

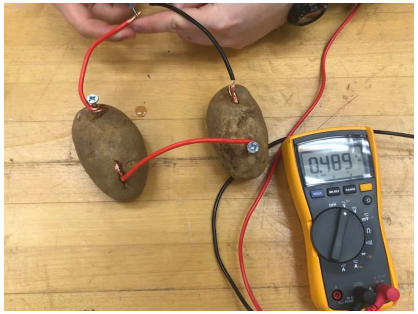
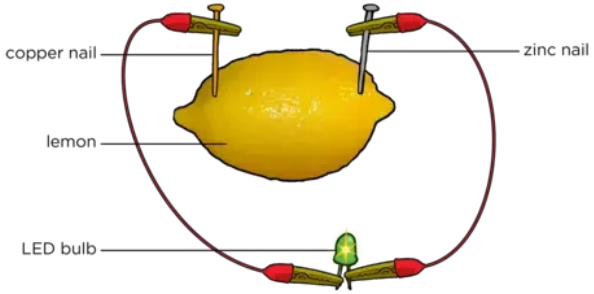


- **Communicating:** We communicate in various modes such as, speaking, writing, drawing, gesturing, acting, modelling, storytelling, etc. **Communication in science is a specialized skill through which scientific knowledge** is shared and communicated among Learners. In a classroom

  a. The use of Scientific languages is different from languages that we speak every day (science as a discipline has its own special set of symbols)

  b. Scientific communication varies keeping in mind the learner (Learner's curiosity and Questions, understanding the Learner's learning difficulties). Based on the above examples, here are a few exemplar Questions and project ideas that lead to further discussion.

Engagement Around Wire	• How does metal wire conduct electricity? • Does the length and diameter of the wire matter in lighting a bulb? • Let's observe around, what kind of wire (Colour, Length, Metals) are used in our home, School, and Market? • Project Work: Meet an electrical engineer and discuss how electricity is supplied to the home.

Engagement around Battery	• How does the battery work? What are the components of a battery? • How to recycle a battery for e-waste Management? • Project Work: Can potatoes and Lemon glow with a LED? •  
	Circuit Design: https://phet.colorado.edu/sims/html/circuit-construction-kit-dc/latest/circuit-construction-kit-dc_en.html

Computer Simulation of circuit design (Use of ICT in Classroom)	Ohm's Law: https://phet.colorado.edu/sims/html/ohms-law/latest/ohms-law_en.html Resistance in a wire: https://phet.colorado.edu/sims/html/resistance-in-a-wire/latest/resistance-in-a-wire_en.html

- **Inferring:** Inferring is using logic to draw conclusions from what we observe and an 'inference' is an explanation to our observation about any object or event. Our inference is strongly correlated to our past experiences and knowledge. In the above example, we may relate this to our everyday experience of electricity at home, at School or any other place. The inference is an evolving process (inductive and deductive) for a learner. In the classroom context, teachers need to be patient with the learners having difficulties since it requires them to have developed formal thinking patterns among them to *experiment* with science. The more your science classrooms are **Active**, the more will be possibilities for learners to learn 'how science is done.

In the classroom, supporting learners to

- help learners learn to record their observations in both qualitative as well as quantitative manner;
- encourage learners for communicating observations honestly **without hesitation and feeling no fear** while reporting results;
- use appropriate questions to guide learners for making authentic observations and inferences;
- provide opportunities to use **various means of communicating** data/ results of their investigations, such as charts, graphs, models, etc.;

The process of doing science is not linear. Apart from skills (Observation, classification, communication, Inferences) described above, there are other skills as well in science- those are acquired later by learners once they have learnt using basic process skills. The following skills require higher order thinking and reasoning and hence they are mainly practised in upper grades. These integrated skills include

- Identifying variables (Example: Dependent **Variable** is the voltage V. Control **Variables** are the material, length, cross-section area and temperature of the wire.)
- Hypothesizing (example: If I place two batteries in a series connection, then the bulb will glow better)

- Experimenting (Example: Sustainable Electricity from salt water: This is because salt water is a good conductor of electricity which makes ocean water a resource for renewable energy. Experiment: salt water can help to produce electricity.
- Interpreting data: (Example: for domestic purposes, copper wire is used, Interpreting electricity Billing data of a school/Home. So if we replace the copper wire with iron what will happen to bill)

Concluding discussion: We have understood that developing scientifically is basically acquiring positive scientific attitudes. Attitudes influence the way we respond to anything, therefore a child with a positive scientific attitude will perceive science around objects, content, activities, people, etc. The scientific attitude is nurtured over a period of time resulting through a **continuous engagement with relevant learning activities;** like performing various experiments, asking questions, collaborative project works, reading scientific text etc.

Small Group Activity: 2

Objective: Understanding the perspective of the Science classroom.

Activity: From a science textbook (consider any facts, concepts, definitions, principles and theories presented in the chapter), Suggest a classroom or outside class activity, which will demonstrate Science as a body of knowledge, a process of inquiry and a way of thinking.

The output of the activity: To get familiar with engaging science in the School. (Note: in this process, it is important to appreciate the value of Inquiry and Way of thinking in Science Education in Schools)

Instruction to Participant: The Trainer will ask the participants to divide into their respective groups. The trainer will show the following activity slide to the class and ask them to discuss it in their groups.

procedure: After the following classroom discussion, the Trainer will explain the activity to the classroom.

Trainer's Lecture Notes:

Body of Knowledge:

If you see any textbook on Science, you can easily find various **facts, concepts, definitions, principles and theories** associated with Science. A few of them have lasted long and have been a part of scientific knowledge for generations. Some important characteristics of scientific knowledge are:

- It is tentative. (example: Before 2021, We believed that Pluto was a planet in the solar system. Pluto is not a planet because the International Astronomical Union (IAU) requires certain criteria that it does not meet. As of 2021, Pluto is a dwarf planet)
- The Objective of Science is to provide an explanation of natural phenomena (Example: How metal conduct electricity or How We can convert a chemical energy into electrical energy; Battery, why we use tungsten mental into bulb filament)

Inquiry

When you start teaching and learning Science in your class, you have to go through various processes to investigate through **Observation, Inference, Classification, Communication, Measurement, Prediction** etc. The skills are important for scientific investigations in everyday life. In a Science classroom, the teacher is expected to provide opportunities for the learners to participate in some investigative activities which will help them to understand the nature of the scientific inquiry. Inquiry encourages the learners to think about the relationships between facts, options, processes and events.

Example Questions:

- Why is ice slippery?
- Does pressure melt ice?

- How do we measure the speed of light? Does electricity travel at the speed of light?
- Where does the sun get its energy?
- Can you perceive acceleration?

Way of thinking:

Science is a body of knowledge and a process of inquiry but both these aspects are closely related to the third one i.e. Science as a way of thinking. Scientific ways of thinking can be promoted by making our learners able to **explore, analyze, and evaluate** in a scientific manner. Scientific ways of thinking will make our learners collect evidence that can be physically observed and measured. This is called empirical evidence. The scientific way of thinking also allows starting to question **why and how things are as they are**. Science as a way of thinking involves scientific temper, scientific inquiry, and accepting that scientific ideas are tentative while interpreting the evidence are its important ingredients.

Concluding Discussion: (Trainer will explain to participants)

Science classrooms in schools are aimed at developing scientific skills such as observation, measurement, data analysis, mathematization, visualization and representation. Also, activity-based learning aims to contribute to students' beliefs about science education and enable them to improve their classroom participation.

- Collaboration: This is an integral value in scientific work and will reflect in the CLIx Science pedagogical approach through group discussions, sharing of data and students reviewing each other's work inside/outside the classroom.
- Flexibility for teachers: The modules are designed so that teachers may modify them in order to make them appropriate
- Learning from your own/other mistakes is an important pedagogy of learning science. Activities that give students meaningful feedback (rather than scores/ grades) about their progress will enable learning opportunities.

Additional Note for Trainer:

The general aims of science education follow directly from the six criteria of validity

- **Cognitive validity** requires that the content, process, language and pedagogical practices of the curriculum are age-appropriate, and within the cognitive reach of the child.
- **Content validity** requires that the curriculum must convey significant and correct scientific content. Simplification of content, which is necessary to adapt the curriculum to the cognitive level of the learner, must not be so trivialized as to convey something basically flawed and/or meaningless.
- **Process validity** requires that the curriculum engage the learner in acquiring the methods and processes that lead to the generation and validation of scientific knowledge, and nurture the natural curiosity and creativity of the child in science. Process validity is an important criterion since it helps the student in 'learning to learn science.
- **Historical validity** requires that the science curriculum be informed by a historical perspective, enabling the learner to appreciate how the concepts of science evolve with time. It also helps the learner to view science as a social enterprise and to understand how social factors influence the development of science.
- **Environmental validity** requires that science be placed in the wider context of the learner's environment, local and global, enabling him/her to appreciate the issues at the interface of science, technology and society and preparing him/her with the requisite knowledge and skills to enter the world of work.
- **Ethical validity** requires that the curriculum promote the values of honesty, objectivity, co-operation, freedom from fear and prejudice, and develop in the learner a concern for life and preservation of the environment.

Small Group Activity 3 (25 Mins Discussion + 5 Mins Presentation)

The **Theory of Change (ToC) NESP III** is summarised under Equitable Access: Increased equitable and inclusive access to relevant, safe, and quality learning opportunities for children, youth, and adults in Afghanistan, especially women and girls.

Activity: Identify the factors that encourage girls to pursue Science and Allied field careers.

The output of the activity: It is expected that participants will bring innovation wrt inclusiveness.

Instruction to Participant: The trainer will share the Questions with participants and ask the small groups to discuss for 25 Mins.

Triggered Questions: (Also What are suggested ways of doing so?

- What stereotypes exist about girls pursuing careers in science and allied fields?
- How do those stereotypes specifically affect girls in schools?
- What actions do you propose to get more girls into Science and Allied field careers?

Concluding Discussion:

Trainer's Lecture Notes: Let's talk about science and Society.

Science responds to the needs and interests of the societies in which it takes place. A topic that meets a societal need or promises to garner the attention of society is often more likely to be picked up as a research topic than an obscure question with little prospect for a larger impact. For example, over the last years, science has responded to the Covid 19 Pandemic with a massive research effort. Society's desire to slow the spread of covid 19 and develop effective vaccines and treatments has focused on scientific research, which improves our understanding of the immune science and Allied field and how it interacts with viruses, drugs, and mutants. Developing vaccines, Trials, Documentation, Approval of Vaccination drives etc all these processes took time and effort. It is also important to reflect, on how we achieved this success within 18 Months. What are the inputs? It may be the years of hard work of

individuals, It may be universities that produce the best scientists, It may be a teacher, Family members of the community who motivated those scientists. It may be the country that creates policy and ensures that it is implemented due diligently.

Similarly, to achieve National Goals, it is important that all the mechanisms, processes, people and Pedagogy must revolve simultaneously. Science does contribute to every aspect of life whether it is economical development or finding solutions for sustainable development. School and education system overall not just shapes the knowledge of science but also shape the priorities of scientific development. The following action Plans are to be placed in schools and outside schools to make this happen. It requires collective efforts toward design intervention around STEM for example where female students can get meaningful opportunities in Schools and higher education. The process is as follows:

- Raise **awareness** that girls and women are as capable when given encouragement and educational opportunities.
- Promote **community engagement** about how they can encourage daughters as much as sons in math and science — supporting learning opportunities and positive messages about their abilities.
- Teach girls, teachers and parents that science skills are learned and change over time — promoting a growth mindset that empowers girls to take interest in science education.
- Emphasize **storytelling** about women who contribute to science.

Activity 4: Structured reflection of the day

Structured reflection (25 mins + 10 mins)

- The participants will end the day with the structured reflection session. The trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer

questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.

- All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision science and Allied field, and how best they can be used to improve on them.
- It is up to the trainer's discretion on how they want to proceed.
- To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and trainees get to actually comment on their training to make it their own. Interactive diaries Material required: Any notebook and a pen. The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as

1. What did you learn about in today's training?

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors. as references for further reading.

----------Day End----------

*******End of Day 5****

DAY 6

Pedagogy of Social Science

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Trainer understands the Afghanistan context. ● Familiar with Social Science subjects ● Understanding of Various Pedagogical procedures of teaching social sciences. ● understanding child or student-centered pedagogical approaches	1. Understanding the core objective of teaching social science in the school. 2. Understanding the skills and prospective social science curriculum should strengthen students. 3. Understanding different pedagogical tools/ methods for social science pedagogy.

Day	Sub-topic	Concepts	Pedagogy	Time
Day 6	Competencies: Teaching and learning, pedagogy, pedagogical tools, Applying Multiple Teaching Style and instructional strategies to engage student in learning process			
	Pedagogy of Social Sciences		Activity 1: Discussion on understanding social science as a subject.	60 Mins
			Break	10 Mins
			Activity 2: Understanding different skills and values social science contributes in student development.	60 Mins
			Lunch Break	60 Mins
			Activity 3: Understanding different pedagogical tools/ methods and its usage for social science pedagogy.	60 Mins
			Break	10 Mins
			Activity 4: Structure reflection	60 Mins

Start of the day: Greetings to Participants.

Before starting the first activity of the day, let's try to understand Pomegranate production in Afghanistan. This is one of the agricultural products that Afghanistan Supplies across the world.

The trainer will have an ice-breaking session discussion on Pomegranate production in Afghanistan. The trainer will initiate the discussion by asking participants about the geographical and demographic area in which this is cultivated as a significant contributor to the Afghan agricultural economy. Pomegranates are a major fruit crop in many provinces such as Kandahar, Helmand, Wardak, Ghazni, Paktia, Farah, Kapisa and Balkh, and are the source of the livelihoods of thousands of people. The trainer will further ask what the different cultural and agricultural factors contribute to the development of the whole industry. What are the different government-supporting schemes and initiatives that led to its development? After having this initial discussion, the trainer will say, this is one way of social science pedagogical tools where discussion can be used within the classroom for social science teaching to construct knowledge together over a concept.

Similarly, let's think about the food that we consume, our interaction with markets and banks, the festivals that we celebrate etc. Social science helps us to understand and gives us tools to understand it more deeply. In choosing the themes (Pomegranate production in Afghanistan) we have tried to ensure that we learn about developments in different spheres – economic, cultural, social & political. Let's take another example: Themes like Use of Horse in Afghanistan Cultural & Sports, History of Jami Masjid of Herat, Music from ethnic groups such as the Pashtuns, Tajiks and Hazaras etc will help us to explore the way societies are organised, society groups interact and change of economies, and the development changes within societies.

Activity 1: Discussion on understanding social science as a subject.

Time: 60 Minutes

Objective: Improve the Participant's understanding of the importance of social science.
Output: Participants will gain knowledge & skills of the underlying principles of social science as a subject.
Resource Required: Computer, PPT, chart paper.
Activity: What do you understand from social science as a subject?

The trainer can also suggest some guiding questions to generate responses from the participants such as, what comes under social science? To explore further, the trainer can ask questions using their surroundings, what are the areas which can be explained/learnt through social science classroom.
(Participants may consider any one event, Place, River etc from Afghanistan)
Place: Babur tomb, National Museum of Afghanistan, Blue Mosque,
Sports: Rohullah Nikpai (2012 & 2016 Olympic Winner), Rashid Khan and his performance, Afghanistan Sports Culture
Agriculture: Soil, Water Resource, Produce, Export, Local Markets, Transport, Supply chain etc.

Procedure:

- The trainer will display the activity and display on ppt and run through it and facilitate conversation.
- Participants will discuss in their respective groups for 15 Mins
- After Discussion, One Representative from each group will summarise the group discussion to the whole class.

Trainer Notes:

After posing the question, the trainer will gather the response of the participant and their understanding and put it on chart paper. While capturing the participant's response, the trainer will conclude the discussion by explaining social science.

- The social sciences explore aspects of human surroundings for example discussion on population, exploring different types of society and complex human relationships.
- Social science perspectives and knowledge are indispensable to building the knowledge base for a just and peaceful society.

- The social sciences encompass diverse concerns of society and include a wide range of content drawn from the disciplines of history, geography, political science, economics, sociology and anthropology.

Concluding Discussion:
The trainer after the guided discussion with PPT will conclude that these different aspects of social science can be part of any topic or concept chosen in the Afghanistan textbook. For example, if the textbook focuses on understanding water. Then over different phases of social science, the water can be studied in geography, it could be studied in economics in civics, and the right to water could be studied. Different aspects covered under different subject domains will build and create a perspective of students over water. To understand further, in the next activities we will be discussing how in different phases and domains of subjects, the holistic perspective and conceptual understanding of a topic can be built in social science.

In Social sciences, a Variety of concepts that will be dealt with are

- Culture: Society- social stratification, marginalization, diversity, Discrimination.
- History: Time, Events, Continuity and Change, Culture and Civilization.
- Civics, Public Administration: Governance, Power, Authority, Citizen.
- Geography, Science & Technology: Space and Geography, Natural and Social Resources, Control and Distribution
- Economics and Public Finance: Public and Private, Development and Progress, Market and exchange.

Activity 2: Understanding different skills and values of social science contributes to student development.

Time: 60Minutes

Objective: To make participants understand different skills and social science aims to build.
Output: Participants will understand the skills.
Resource Required: PPT, chart paper.
Activity methods; – Group work (participants to break out into groups of 5 pax per group?), plenary

Activity: What are the skills social science teachers focus on building while teaching social science?
(Participants will select history, geography or civics curriculum to identify and articulate the skills required)

Procedure:

- The trainer will ask the questions displayed on PPT to the participants.
- The trainer will display the activity and display the guided discussion questions one after another to facilitate discussion. on ppt and run through it and facilitate conversation.
- (Break out Activity: Small Group Discussion) Participants will discuss in their respective groups for 10 Mins
- After Discussion, One Representative from each group will summarise the group discussion to the whole class.

Trainer Notes:

- The trainer can also suggest some guiding questions to generate responses from the participants such as what skills history, geography and civics curriculum and teaching can build.
- To explore further, the trainer can ask to build on the discussion on whether History class should focus on rote memorisation of important events or it should focus on understanding the same event from a different perspective. Similarly, geography should focus on understanding just different types of landscape and its definition, or it should also focus on understanding the landscape and sensitizing students towards its importance as a natural resource along with its evolution.

- While stating these examples, and posing questions to participants, the trainer will then ask by studying these subjects in this manner what the different skills will be built. The facilitator can give an example to participants - while a student reads about the Kabul river, what skills they developed over the period of time in different phases and different aspects are covered. For example, Kabul's geographical area, vegetation grown around it, economic and cultural practices surrounding the Kabul river, the industrial development around it, population dependency and how the Kabul river as a water resource can be naturally sustained.

- After discussing the example with participants, the trainer will have a discussion on the different types of skills the student will develop. The trainer will then ask the participant to map the skills students will develop over time and gather their responses. After the group discussion, the facilitator will share the skill set and connect to various examples shared by Participants.

facilitate in developing curiosity
facilitate in developing critical thinking
facilitate in developing aesthetic sense
facilitate in developing problem-solving
facilitate in developing systemic thinking

Concluding Discussion:

The trainer will emphasise that any concept in social science could be facilitated to build different thinking if the teacher emphasises on different aspects of the same concept. In social science, it is important to make facilitation participative and active. It is extremely important to shift from merely imparting information to debating and discussing the information from multiple perspectives so that students actively participate to construct knowledge. Concepts should be clarified to students through lived experiences of individuals and communities. It has often been observed that cultural, social and class differences generate their own biases, prejudices and attitudes in classroom contexts. The approach to teaching, therefore, needs to be open-ended. Teachers should discuss different dimensions of social reality in the class, and work towards creating increasing self-awareness among themselves and the learners.

Activity 3: Understanding different pedagogical tools/ methods to teach social science.

Time: 60 minutes?

Objective: To improve participants' understanding of different methods and tools & how they can be used for social science pedagogy.
Output: Participants will understand different tools and methods for teaching social science pedagogy.
Resource Required: PPT, chart paper.
Activity: Why Local Election Matters
Activity methods; group work, plenary

The trainer will divide the group into small groups and ask the participants what are the different pedagogical tools/ methods which can be used to teach social science. Let's consider the following example to think about different pedagogy. (**Why Local Election Matters with the following objectives**).

- Learners will be able to identify some of the ways local governments affect their lives.
- Learners will recognize the impact of a single vote.
- Learners will be able to identify how their state's laws work to encourage voter participation.

Procedures:

- Trainer will discuss the various Active learning pedagogies to teach social science subjects.
- Trainer will ask the participant to discuss within their group to use these different tools and methods to **teach Why Local Election Matters**. The participants can use either one of the tools and methods discussed before, or they can use multiple.

- After the presentation by a different group the trainer will ask the participants, what are new tools and methods they understood from today's session can be integrated into the classroom in the Afghanistan context to strengthen the teaching of social science having observed different classrooms.
- The trainer will display the activity and display the guided discussion questions one after another to facilitate discussion. on ppt and run through it and facilitate conversation.
- The trainer will ask the questions displayed on PPT to the participants.
- The trainer will display the activity and display the guided discussion questions one after another to facilitate discussion. on ppt and run through it and facilitate conversation.
- Participants will discuss in their respective groups for 15 Mins
- After Discussion, One Representative from each group will summarise the group discussion to the whole class.

Trainer Notes: Different pedagogical methods and tools could be:

The Guided Discussion

Definition: A discussion or dialogue between the facilitator and the learners in which the facilitator asks specific planned questions designed to draw learning points from the learners.
Purpose: To disseminate information, increase awareness, and help participants understand concepts.
How to proceed

- Identify the learning points to be brought out in the discussion
- For each learning point, the facilitator should Craft a question. Note the most likely learner responses to the questions.
- Plan follow-up comments to augment learners' comments, and go on to the next question.

Appropriate to use when Learners already know something about the content, and can readily engage with it at some level. Tips:

- Use a guided discussion to "debrief" learning activities, after a structured exercise or skill practice completes. It's designed to close the gaps in the learning, summarise the main points, and help learners apply the content to the job.
- In a debrief, ask open-ended questions, such as - What happened in the activity?
- How did that make you feel?

- Which principles or generalisations can you infer from it?
- How will you apply it going forward? - What went well?
- What could have been done better?
- How does this apply to your job? - What will you do differently in the future? Make sure that your augmenting comments for each question and more content to the discussion should not simply repeat what the participants have said.

The Role Play Demonstration & Practice

Definition: A skill practice (complex structured activity) in which learners watch a demonstration of a skill, and then practice that skill with feedback from the facilitator.
Purpose: To help learners practice a "physical" skill, as in something that learners "do with" things.
How to proceed

- Develop a "checklist" tool that contains the steps of the physical process being learned (Nomination, Filing, understanding rules etc) prior to facilitating the demonstration and practice.
- Set up the physical demonstration in front of the learners. This setup must be the real thing (for example, if they're learning to type on a keyboard, there should be an actual keyboard) or the most close-as-possible simulation of the real thing (such as cockpit simulator demonstrations for aspiring pilots who can't be in a real cockpit while learning).
- Distribute the demonstration behavioural checklist. Demonstrate the physical skill while verbally "walking" the learners through the items on the checklist.
- Have each person practice the skill while being observed by the facilitator or a fellow participant using the checklist.
- Give feedback according to how well each learner adhered to the checklist.

Appropriate to use when the learners are ready to practice a physical skill, such as operating a piece of equipment, lifting an object that requires a special technique, installing a piece of software, or using technological equipment to support a presentation.

Tips: Physical tasks are process-oriented-that is, learners must follow specific physical steps to produce the desired outcome. The assumption is

that if learners follow the required steps, the desired outcome or product will result.

The Interactive Lecture

Definition:

Interactive lectures are classes in which the instructor incorporates engagement triggers and breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material. The engagement triggers capture and maintain student attention and the interactive lecture techniques allow students to apply what they have learned or give them a context for upcoming lecture material. Newcomers might want to begin with one activity during a class period, but may eventually call upon a blend of various interactive lecture techniques all in one class period. Breaking up the lecture with these techniques not only provides format change to engage students, these activities also allow students to immediately apply content and provide feedback to the instructor on student understanding.

Purpose: To disseminate information, increase awareness, and help participants understand concepts.

How to proceed

- The facilitator presents content (a mini-lecture lasting only a few minutes)
- The facilitator then invites participation by questioning the learners and by inviting their questions.
- The facilitator continues to share content and invite participation throughout the entire activity. By inviting participation, what is normally thought of as a lecture by the facilitator becomes a discussion with the learners.

Appropriate to use when Learners know relatively little about the content, and therefore must learn about it before they can interact with it.
Tips

- Identify questions that will invite learner engagement, and plan intervals when you might ask the questions. Even learners having little or no experience with the subject can answer a question from their own experiences.

- Never deliver a "straight lecture" for more than 15 minutes without inviting participation in some way. Other activities during which it's important to create interaction by asking questions include reading books, handouts; watching videos/films; using slides, PowerPoint presentations; pre-work; note-taking; and completing self-assessments, such as quizzes and checklists.

Concluding Discussion:

After gathering the response from the participants, the trainer will emphasise the need of integrating different tools and methods and how it can make learning more participative. The trainer will also emphasize here the objective is not to use different tools and methods but the focus here should be to support teachers involved in the process of knowledge construction rather than mere information sharing. By using different tools and methods, the teacher should aim for different aspects that can be visualised and understood by students because they experience the different perspectives leveraging these tools and methods.

From the above mentioned example:

Guided Discussion: With respect to the following example, tinkering questions can be

- How do elections affect our daily lives?
- How do governments encourage their citizens from voting?

Role Play: Help students recognize the significance of local elections using the “Who Decides?”
Interactive Lecture: Begin with an “Alphabet Brainstorm” warm-up to get students thinking about the many ways the government shapes our lives. Ask students to work in groups to brainstorm answers to the question, “How does government affect our lives?” Explain that they’ll list one answer for every letter of the alphabet. Provide a few examples: *A = Airport security. Z = Zoos*. After a few minutes, have students share their answers aloud.

Activity 4: Structured reflection
Objective: to connect today's learning in participants' roles and responsibility.
Output: To discuss, reflect and submit the answers in diaries.
Resource Required: Notebook and pen

Procedures:

- Trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.
- All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect about the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.

Trainer Notes:
The participants will end the day with the structured reflection session. To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voice in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and for trainees get to actually comment on their training to make it their own.

Activity: The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as,

- What did you learn about in today's training?
- How do photographs, Video (Other Multimedia, ICT) shape understanding of social justice issues?
- What responsibilities come with information/news and sharing it with students?

- How do we look at the connection between society and education?

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors.

******Day 6 End***

DAY 7

Learning objectives and Approach to lesson Plan

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Understanding of NESP III Goals, Theory of Change ● Familiar with Textbooks and classroom Teaching process	1. Understanding of how to articulate learning objectives. with Stakeholders (Teachers, School head, students, Parents) 2. Collaborate with different stakeholders to define, design and implement interventions based on learning objectives.

Day	Sub-topic	Concepts	Pedagogy	Time
Day 7	Competencies Mapped: Lesson planning, Ability to generate ideas, Problem-Solving, Critical thinking, Curiosity			
	Lesson Plan		Activity 1: What Constitute Learning Objectives?	60 Mins
			Break	10 Mins
			Activity 2: Understanding Bloom's Taxonomy	75 Mins
			Lunch Break	60 Mins
			Activity 3: Connecting Bloom's taxonomy to various school contexts & academic subjects.	75 Mins
			Break	10 Mins
			Activity 4: Structured reflection	45 Mins

Start of the day: (Trainer will explain to the participants)

In our previous days, we learnt about theories, pedagogy, and understanding of various school processes. On all our session days we have set objectives, helping us to prepare, organize and deliver content. Why is articulating learning objectives important? When you write the learning objectives for a lesson, activity, or task, it helps to identify the kinds of materials and topics that will be suitable for the learning outcomes most efficiently. Articulating learning objectives can help us to guide the design of instructional strategies and learning activities. Let's Start today's sessions.

Activity 1: What Constitutes Learning Objectives?
Objective: To equip participants with skills and understanding of the components of writing learning objectives.
Output: Participants will be able to identify whether a statement is a learning objective or not.
Resource Required: Notebook, Computer, Projectors

 Time: 60 Minutes

Procedures:
Step 1: The trainer will explain to the participants about learning objectives. (Lecture notes added below)
Step 2: After Explaining the learning objectives, the trainer will give some examples of Learning Objective Statements (Learning notes added below)
Step 3: Small group discussion: The trainer will ask the groups to discuss in their respective group and identify whether the statement is specific, measurable and satisfies learning objectives conditions. Time available: 30 Mins
Step 4: After the group discussion, the Trainer will conclude the discussion. (Lecture notes added)

Trainer Notes:
An Objective is a description of a performance you want learners to be able to exhibit before you consider them competent. An objective defines the intended results of the instruction rather than the process of instruction. By Definition, Objectives are

- Description of Learning Outcomes and not the learning process
- Very Specific therefore measurable.
- Defined by Small units of Behaviour/Content/Skills/Attitude
- Different from Goals or Aims which are defined at a very high Level.
- Drives content selection, teaching strategies and assessment methods.

Example:

Vague Objective Statements	Specific Objective Statements
Know the law of thermodynamics	State the Law of thermodynamics
Understand the principles of Writing Objectives	Explain/Demonstrate the principles of writing Objectives
Support the Education policy of the Government	*Ask Participants:* *Do you want to Try?*

Steps in Objectives:

Steps	Description
1	Read the topic for which objectives have to be written. It is important to have a clear idea of what the content on hand is all about. This will give a broad overview of what is to be achieved from the topic.
2	Write down what you think the topic is trying to convey. This will keep you thinking in a particular direction keeping the learner and the content in the focus.
3	What do you want the learner to take away from the topic? By now, you probably have a clear picture of the topic in the relation to the learner. This will help you to write the objective statements clearly, starting with what the learner will be able to do after

	completion of the topic.

Small Group Activity: (30 Mins)

SL No.	Statement (Learner will be able to...)	Specific (Yes/No)	Measurable (Yes/No)	Learning Outcomes (Yes/No)
1	Draw the structure of the Human Heart			
2	Write the Names of the country in order to their Proximity to Afghanistan.			
3	Favour the policies of the world health organisation.			
4	Study the given scenario to understand the function of the Afghanistan tax system.			
5	Use the given self-study materials to understand the various public policies in Afghanistan School education.			
6.	Apply the Microsoft Excel tool to manage School level documentation.			
7	Discuss ways to improve staff room culture.			
8	Support the vaccination policy of the government.			

9	Show a positive attitude towards juniors.			

Concluding Discussion: In a classroom context, learning objectives are important for the following reasons.

- It helps us to design the learning space, helps teachers to map Teaching learning materials mapping with activities, and helps to understand the learner/s prior knowledge
- If learning objectives are not appropriate to learners, then we may break the learning objectives into multiple sub-objectives. It will help teachers to engage with students meaningfully.

Activity 2: **Understanding Bloom's Taxonomy**
Objective: Improve participants' understanding of Bloom's Taxonomy learning levels.
Output: Participants demonstrate proficient knowledge of and are able to apply Bloom's Level of Learning in various learning contexts.

Resource Required: Notebook, Computer, Projectors

Time: 75 Minutes?

Procedures:

- Trainer will explain Bloom's taxonomy in brief. (Lecture notes added below)
- After the Lecture Notes, Trainer will distribute the Reading references to Participants. Here is the Link to the document. http://www.et.iitb.ac.in/Resources/files/TL_ICT/blooms_taxonomy.pdf
- Trainer will show the activity sheet table to participants on the computer/Projector. Ask the small groups to discuss and come up with their answers.
- After the discussion, the Trainer will conclude this activity.

Lecture Notes: Bloom's taxonomy is a toolbox that teachers or students can use to classify and organize learning objectives. It's most popular version is based on the cognitive domain and assumes that learning should be structured from easy to difficult in the following 6 steps:
1. Remember 2. Understand 3. Apply 4. Analyze 5. Evaluate 6. Create

- On the first level we learn to remember. There is just rote memorization and recollection of facts without much understanding. For example, if we learn about lemons, we want to remember the name, shape, colour, size and that they are sour. Once we memorize these essentially meaningless facts, we move to the second level of learning.
- On level two we learn to understand. We begin to decode information and learn that a lemon is yellow when it's ripe to eat, and if we take a bite, that it's really super sour. We also understand that lemons love sunshine and that they contain lots of vitamin C, which is a great natural antioxidant that keeps us healthy. Now as we really understand a lemon, we can work with it.
- On the third level we apply what we know. We've understood that while lemons are sour, they are also a great provider of vitamin C. To apply this knowledge in a meaningful way. We could boil a lemon into hot water and add some honey.
- On the fourth level, we learn to analyze. This involves examining and breaking down information into components, determining how the parts relate to one another, and finding evidence to support generalizations.
- Now we are ready to evaluate. We analyze, critique and compare. To evaluate our lemon as a good source of vitamin, we compare it to other sources, such as oranges and supplements. We look at the following properties: vitamin levels, affordability, taste, and packaging waste. If we evaluate ourselves critically and without bias, we learn where the lemons score high and where others score higher.
- Now after we have learned, understood, applied, analyzed and evaluated, we are ready to create. As we now really understand lemons, also in comparison to similar things, we can formulate a plan to create our own natural lemonade.

Activity Table: Group Activity: Bloom's Level of Learning

SL No.	Statements	Bloom's Level of Learning	Why?

1	Describe the communication cycle between school and community.		
2	Recall the formula for calculating percentage.		
3	Analyse the different views measuring centigrade into Fahrenheit.		
4	Predict the new entrant in the school based on last year's community engagement.		
5	Propose five questions for Teacher-Parents interaction.		
6	Copying spin Bowling of Afghanistan Cricket Player Rashid Khan.		
7	Use operant conditioning principles in designing a reward system for children.		
8	Assess the quality of farm produce because of weather.		
9	State a memory requirement for approaching a Quadratic equation.		
10	Decide which article should be published in your school newsletter.		

Concluding Discussion:

- Bloom’s taxonomy is a hierarchical system that categorizes the thinking skills of learners, ranging from recalling information, which is the most basic skill to evaluation, which involves judging and stating an opinion about information.

- Bloom's taxonomy is an effective tool that teachers and educators can use to create lesson plans and tests in the bid to encourage critical thinking.
- The following table helps us to see how different verbs can be used in bloom's taxonomy levels.

Bloom's Definition

	I. Remembering	II. Understanding	III. Applying
Bloom's Definition	Exhibit Memory previously learned materials by recalling Facts, basis, concepts and answers.	Demonstrate understanding of Facts and ideas by organising, comparing, translating, interpreting, giving description and starting main ideas.	Solve problems to new situations by applying acquired knowledge, Facts, Techniques and rules in a different way.
Verbs	Choose, Define, Find, How, Label, List, show, Spell, Omit	Classify, Compare, Contrast, Discuss, Demonstrate, Extend, Explain, Show, Summarise	Apply, Choose, plan, select, Solve
	IV. Analysing	V. Evaluating	VI. Creating
Bloom's Definition	Examine and break information into parts by identifying motives and cause. Make inferences and	Present and defend options by making judgements about information, validity of ideas and Quality of work based on	Compile information together in a different way by combining elements in a new pattern or

	evidence to support generalisation.	a set of criteria.	propose alternative solutions.
Verbs	Assume, Categorize, Examine, Inspect, Discover	Award, Criticize, Deduct, Estimate, Justify, Prioritise, Prove, Rate, Recommend.	Adapt, Build, Change, Design, improve, predict, modify, Purpose, Delete, Discuss

Activity 3: Connecting the Bloom's taxonomy to various school context & academic subjects.
Objective: To understand the application of the Taxonomy concept in classroom context.
Output: Participants will be able to apply the theory into various learning situations.
Resource Required: Computer, Projector, Notebooks for participants.

Time: 75 Minutes

Procedures:

- Trainer will ask the small group to discuss in their respective groups and try to solve the activity.
- For better understanding: Trainer may use the first statement as an example (mention in the table below)
- After 30 Mins, the Trainer will conclude this activity.

Activity: Change the level of objectives given below. The first Statement has been solved as an example. (30 Mins)

SL No.	Statements	Bloom's Level of Learning
1	**Recall the seven wonders of the world.** **(Change the objective into Level 2)**	**Locate the seven wonders of the world on the world map.**
2	Apply BODMAS (Brackets, Orders, Division/Multiplication, Addition/Subtraction)	Change the objective into Level I

	rule to solve a given problem	
3	Propose a strategy to retain students in schools.	Change the objective into Level VI
4	List three properties of Atoms and Molecules.	Change the objective into Level IV
5	Recall the timetable changes of your school	Change the objective into Level V
6	Use appropriate group dynamic skills to secure corporation among teachers	Change the objective into Level I
7	Evaluate a growth of students in Learning Mathematics	Change the objective into Level III
8	Analyse an Afghanistan Education Department campaign that conveys stability and reliability	Change the objective into Level V
9	Select Toys for your School children	Change the objective into Level VI
10	Select the article that will be printed in the next issue of newsletter	Change the objective into Level I

Concluding Discussion: In a classroom, it is always easy for students as well as teachers to understand and build knowledge from known to unknown rather than building completely new knowledge. Also, it reinforces the confidence of students that they are not learning things completely new, they are learning something in which they already have a certain exposure.

Let's think about lesson plans. Once we articulate the learning objectives, it will be effective for us to plan/design the other components of lesson design. Here are some of the other components of lesson designing. The following components will change based on learning objective, learning space, availability of resources and subjects in particular.

- **Objective of lesson**: The teacher must define the objective of the lesson planned and to be facilitated. The clarity of coverage of depth and breadth to be covered to be learnt by students.
- Resource Requirements and TLM Design
- **Outcome of the lesson**: The teacher must define outcome as at the end of the lesson facilitated what the learners have learnt in terms of concepts/ procedure and other disposition.
- **Assessment**: To identify whether the objectives of lesson plan are effectively facilitated, the teacher then identifies a process of assessment aligning to objective to identify whether the outcome of the lesson can be demonstrated by the learners at the end of the lesson facilitated or not.
- **Timeline of different steps:** A lesson effectively has many components like instruction by teacher, demonstration activity, assessing students for checking the effectiveness of the delivery therefore, the teacher must calculate the different component timing for effectively facilitating the lesson plan.
- **Pedagogy: Scaffolding** is the important pedagogical approach which all teachers should include to facilitate lessons to children. Scaffolding means, teachers giving instruction or demonstration to students in a way that a complex task is broken into steps, so that students are able to perform the task with adult support.

Activity 4: Structured reflection
Objective: to connect today's learning to their Job responsibility.
Output: To discuss, reflect and submit the answers in diaries.
Resource Required: Notebook and pen


Time: 45 Minutes.

Procedures:

- Trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.
- All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.

Trainer Notes:
The participants will end the day with a structured reflection session. To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors'

voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and trainees get to actually comment on their training to make it their own.

Activity: The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as

- What did you learn about in today's training?
- What strategies (discuss the issues to come up with intervention objectives) are helpful when working with other education officials to plan a project in a school or in a community?
- How can we inspire school heads to stand up for what they believe in and make a difference in a classroom?

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors.

******Day 7 End***

Template: Interactive Diary

Idea: Participants can take use these as records for later.

Name:

Learning Theme	**Keywords**	What did you learn about in today's training?	What strategies (discuss the issues to come up with intervention objectives) are helpful when working with others education officials to plan a project in a school or in a community?	How can we inspire school heads to stand up for what they believe in and make a difference in the classroom?	Questions if any? Thought triggers for others. Any personal note, Experiences from Classrooms

DAY 8

CONCEPT: School Management

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Understanding of NESP ● Understanding of present school processes of Afghanistan ● Knowledge of school timetable and academic calendar	1. Continuously learning and demonstrating the ability to solve complex problems. 2. Create effective and innovative solutions around pedagogy. 3. Create learning and growth opportunities for people, processes and institutions.

Day	Sub-topic	Concepts	Pedagogy	Time

Day 8	**Core competencies developed:** Communicate & Interact Effectively, Developing Self and Others, Critical Thinking, Collaboration with Others, Listen Actively, Inspire Others			
	School Management	Critical Thinking, Collaboration with Others, Managing Resources	Introduction to Case Study	40 Mins
			Caselet 1: Approach to open up unseen areas of organisational disagreement and drives for collaborative solutions.	50 Mins
			Break	10 Mins
			Caselet 2: Develop an attitude of critical thinking to solve complex problems.	50 Mins
			Lunch Break	60 Mins
			Caselet 3: To create a strategy for the culture that fosters efficient and effective interaction and decision-making.	50 Mins
			Break	10 Mins
			Caselet 4: to develop an understanding of the importance of deliberated instruction in a classroom.	50 Mins
			Caselet 5: To develop an understanding of resource availability and use strategies to Optimize the resources in a school for providing better learning opportunities.	50 Mins
			Activity 6: Structured Reflections	40 Mins

Start of the day: Greetings to Participants.

Problem-solving and decision-making belong together. You cannot solve a problem without making a decision. In our everyday lives, we make decisions all the time. It depends on the situation. Some people use a systematic, rational approach in decision-making. Others are more intuitive. They go with their emotions or gut feeling about the right approach. In a school system, we deal with people, processes, funds, function and functionaries. There are both seen and unseen sides to a problem, it depends on how we perceive it. We may have highly creative ways to address the problem, but sometimes cannot explain why we have chosen this approach. There are many pathways to bring innovation to solve a problem. It is important to identify possible alternatives. This is where the creative side of problem-solving really comes in. Brainstorming with a group can be an excellent tool for identifying potential alternatives. Think of as many possibilities as possible. Write down these ideas, even if they seem somewhat offbeat on first impression. Sometimes really silly ideas can contain the germ of a superb solution.

people move too quickly into making a choice without really considering all of the options. Spending more time searching for alternatives and weighing their consequences can really pay off. Today's activities are all about thinking and coming up with solutions. Once a number of ideas have been generated, you need to assess each of them to see how effective they might be in addressing the problem. Consider some of the following factors to end the case discussion.

- Impact on the Learning
- Effect on building relationships
- Impact on Teachers and their Agency
- Cost
- Rules and Regulations
- Ethics of actions
- Whether the action is permitted under collective agreements
- Whether this idea can be used to build on another idea
- There are many more.

Trainer Note:

Procedure: The process of training through the case method involves the steps below.

- The case method involves preparation in small groups, and also discussion with the help of a discussion leader (resource person) of a situation as described in the case.
- Small groups first go through cases and prepare each case individually by assuming the role of the decision-maker in the situation and then decide on appropriate decisions and action plans to resolve the problems faced.
- The group next discusses their inferences and action plans in the forum of a small group. Different individuals might, and in fact, do, come up with different inferences and action plans. Group members need to carefully listen, understand, and appreciate these different views, and thus expand their range of thinking as well as the depth of analysis.
- To enhance class learning, individual participants can play different roles, involving presenting, listening, clarifying, synthesizing and generalizing. However, a participant or a group of participants should not try to dominate the discussion and should try to convince rather than impose their views on co-participants.

Role of the Facilitator:

- The role of the resource person in a case discussion is basically to guide and direct. The objective is to keep the discussion moving towards useful goals, with a minimum of intervention.
- flexibility is necessary in using case materials.
- Ask questions, when necessary,
- Summarize at the end and leave time to pull together the key points of the case.
- Participants in the case method approach often feel uncomfortable because there is no single solution to the situation described in the case. There is no hard and fast answer.

Instruction to participants

The following is a general set of instructions, which could be given to workshop participants to help them with case analyses.

- Read the case through quickly to get a first impression of what it is about or what the basic issues may be. Then, re-read more slowly and begin to note down the facts
- The participant should try to realize when there is a need for more data. if they are not available, what assumptions should be made? Please write down the assumptions clearly before discussing them.
- Listen to fellow participants.

How to close the discussion:

About the School: Aisha-i-Durani School, Kabul Province, the intention of the school is to cultivate knowledge by

- To educate students so that they are able to explore both the world and their inner being
- To inculcate a love for nature and respect for all forms of life
- To create an atmosphere of affection, order and freedom without either fear or license
- free to ask fundamental questions, enquire and learn.

Student Strength: 180

Grade	6	7	8	9	10	11	12
Student Size	40	35	32	22	22	15	14

Head Teacher: Rashid Khan, 20 Years of Experience in Administration, Policy design and implementation

Science Teacher: Sakena Yacoobi, 15 Years of Experience in teaching high school Science, TLM Design

Maths Teacher: Fawzia Koofi, 17 Years of Experiences in teaching Maths,

Language Teacher: Sima Wali, 17 Years of Experiences in Language teaching & actively involved in Storytelling

Social Science Teacher: Aziz Royesh, 25 Years teaching subjects like history, geography and social studies.

Sports Teacher: Roya Rehmani, 10 Years of Experiences in sports and Nutrition education

Caselet 1

objectives: Approach to open up unseen areas of organisational disagreement and drive for collaborative solutions.

Caselet

Aisha-i-Durani School is a government High School in the district of Kabul Province. The school is far away from the town therefore accessibility to school is a problem. However, Rashid Khan had worked as a senior consultant with the Ministry's Afghanistan Quality Learning Initiative (an activity-based child-centric learning approach) before joining the School as Principal. Aisha-i-Durani School has 180 students enrolled. Rashid Khan, has a rich experience in administration, Policy implementation and drafting of educational Law. As a school head, He was keen to take this as a challenge as well as a learning opportunity to lead the school.

Science Teacher Sakena Yacoobi is an extremely committed hardworking teacher and she keeps on learning how to teach better. She was transferred to this school 10 years back and has also positively influenced the 5-member teacher's team in the school where different teachers consult with her whenever they face an issue related to pedagogy. The school has implemented the various schemes initiated under the Afghanistan Quality Learning Initiative quite diligently, and also maintained good relations with the School Development and Monitoring Committee. It is often referred to informally as a model school among the department functionaries.

Over the last year, however, Rashid Khan has been a worried headteacher. His efforts to influence the education department to upscale the Afghanistan Quality Learning Initiative do not seem to be making much headway in his own school. It is true that only Teacher Sakena Yacoobi had adopted innovative pedagogy like Active Learning, Project-based learning, and Hands-on Sciences. She is supporting other teachers in their teaching procedures.

Mr Khan, however, believed that under his stewardship other teachers would be able to take up the task of implementing the Active Learning Pedagogy. High pressure on the teachers to take care of their existing workload, examinations and increasing paperwork for the education department seems to have sapped the morale of the teachers in their implementation of the programme.

Questions:

1. According to you, what could be possible reasons behind the response to the program from teachers?
2. Describe the Symptoms that you notice causing the problems?
3. What steps do you think could have helped in a more positive response from the teachers to upscale the programme?
4. What factors could be contributing to the active female teacher's success in embracing the program?

Caselet 2

objectives of the Caselet:

- Collaboration with others and developing strategies that will deliver quality outcomes.
- Develop an attitude of critical thinking to solve complex problems.

Caselet

Fawzia Koofi is a Mathematics Teacher from Aisha-i-Durani School. Fawzia Koofi has always had an interest in Teaching Mathematics. She has been thinking of doing something useful in Aisha-i-Durani school. Contemplating her own teaching trajectory, she has been inclined towards starting a Mathematics Laboratory in the school focusing on quality hands-on Experiences for students, especially topics like geometry and Probability that would equip students to think critically. Fawzia, herself studied in a resource-rich school and she is aware of the best school practices in the country.

She wants to make her School a resource-rich environment that can be of similar quality and deliver results. She knows she can count on School head Mr Khan and Science Teacher Sakena Yacoobi's support. Fawzia assessed the existing resources of the school and saw how the existing infrastructure could help her to start the Lab. Also, she has reviewed the textbook and started collecting raw materials from nearby stores and reusable items collected from homes. She has analysed the cost-benefits of setting up a Mathematics Lab so that her project will be neither overly ambitious nor under-resourced to conduct various maths activities.

Fawzia knows that there is an inconsistent supply of teaching aids in Kabul province. Her project also intends to attract teachers from other schools to visit and learn how to set up the Maths Lab. She thinks it is also an opportunity to build a community of maths teachers where ideas can be shared. Therefore, she wants to create a community of competent teachers actively involved in toy making to actively learn Maths. Fawzia believes that the evolving nature of maths labs demands innovation and an influx of new ideas. That is only possible when math teachers interact with each other.

However, Rashid Khan likes the idea, but he is not sure about it. Mr Rashid Khan thinks that starting community engagement on school premises will increase unwanted attention towards school. This will divert his team's attention from academics to hospitality. Mr Rashid Khan is very clear about his priority; that is student learning at first.

Questions:

1. According to you, what could be the specific things that Fawzia would be interested in the existing resources available in schools?
2. What do you think are the assumptions guiding Fawzia's approach to setting up Maths Lab in Aisha-i-Durani School?
3. What could be a possible solution to the conflict in the above situation?
4. According to you, what could be possible reasons behind the way Mr Rashid Khan responded to the maths teacher and how can this be mitigated?

Caselet 3

objectives: To create a strategy for a culture that fosters efficient and effective interaction and decision-making.

Caselet:

Aisha-i-Durani School has so far been a School with diversified education interests. The school has decided to tap the potential of ex-students who can volunteer to teach students after school hours or during Holidays. The volunteers are responsible for supporting homework, school project preparation etc. Over the next month, school is going to start around 18 community centres. The decentralised operation of the 18 community centres will be monitored by a group of parents. The group of Parents will be primarily responsible for the overall review of the community center's performance. Here performance means student attendance, Number of intervention hours, discipline and safety of children.

The School head Mr Khan undertakes monitoring visits to the 18 centres on a periodic basis. In his visit, he would like to observe the classroom, cross-check attendance, and discuss with students and parents. His personal involvement as school Principals in this intervention will motivate education youth to be part of a larger purpose.

Language Teacher Sima Wali & Social Science Teacher Aziz Royesh wrote an Email to Mr Khan. The email reads,

Dear Sir, Your personal engagement and idea to tap ex-student time is highly appreciable. But we believe that Volunteers are not trained to deal with pedagogy and teaching subjects. In the long run, this effort will seek serious criticism from academic authorities. Also, we are proposing a research study to check the validity of the proposed intervention. If the idea has potential, then We may design a test for volunteers and conduct a series of induction training for those who passed the test.

In WhatsApp, Aisha-i-Durani School's Sports Teacher Roya Rehmani suggested that scaffolding might work. Let's identify existing senior-grade students who are good at subjects. We may ask senior graders to help their junior students during holidays. Through the intervention, teachers can guide students.

Questions:

1. After receiving ideas from the teacher, what are possible pathways the school may consider to ensure quality intervention?
2. What do you think about the procedures (Step by Step) to address the concerns raised by teachers?
3. Do discuss the cause-effect relationship while suggesting pathways, (think through Pedagogy, Content, and decision-making)
4. What would be the objective, expected outcome, the scope of work & timeline, If you were to design the research proposed by teachers in their email?

Caselet 4

objective: To develop an understanding of the importance of deliberated instruction in a classroom.

Caselet:

A dropout student from the school reflects on his schooling experience and shares what he had missed in his schooling:

"*I was too excited to go to school when I was admitted to the school. I was the first in my family. Although my sister, a year older than me, was equally excited but never got the opportunity to study. On my first day, my teacher was teaching me how to write letters. I was able to write well but students around me were writing much better than me. I was trying my level best yet my teacher and the students around me were constantly saying* ***"write it properly"***.

*Sometimes they supported me by demonstrating "writing it this way". This continued, and slowly I was able to write but faced difficulty in reading the sentence. The instruction of my class does not change, the teacher continues to say, "****read properly****. I never understood the difference between what she expected and what I was doing. Others understood and teachers were happy. I continue to struggle; the instruction does not change. From reading sentences, my fellow students have moved to read stories. Now I do not feel I belong to the same class."*

1. 'Read properly' or 'Write properly', what does it communicate to students?
2. Whether students are performing up to the expectation or struggling to understand, what would you have done in this situation?
3. What do you think could be better instruction by teachers to facilitate children to learn?

Caselet 5

objective: To develop an understanding of resource availability and use strategies to Optimize the resources in a school for providing better learning opportunities.

Caselet: Aisha-i-Durani School was recently selected under National ICT Initiative. Under this initiative schools will be provided with 15 Computers, Tables, Chairs and Software and Teaching learning resources. The objective of this project is to develop digital literacy skills and integrate ICT into subjects (Maths, Science, English). The Government has already planned the training for teachers to develop the capacity to manage ICT assets and integrate ICT Skills into school subjects. The Government has also prescribed that all the students must get a minimum of 20 Hours of hands-on experience with ICT tools, Applications, Games and Other software to be familiar with ICT and confidently use computers to enhance their skills. In the Content that the government provides, there are no videos. For Active Learning Engagement, all students have to spend hands-on time in the ICT Lab to get the required exposure to ICT Skills.

Now Aisha-i-Durani School has 180 Students (Please see the Grade size above). Can you suggest some strategies to the school:

- How can ICT Classes be adjusted in a timetable?
- If the computer class has only 15 Computers and sitting arrangements for 30 Students, how are you planning the class?
- In what possible way can you plan so that all teachers can get the opportunity to integrate ICT in the regular Classroom Process?
- Does the school need to allocate time for teachers in the ICT classes? If yes, Why? If not, why?

Activity 6

Structured reflection (25 mins + 10 mins): The participants will end the day with the structured reflection session.

The Trainer will ask the participants to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.

All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.
It is up to the trainer's discretion on how they want to proceed.

To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and for trainees to get to actually comment on their training to make it their own. Interactive diaries Material required: Any notebook and a pen.

The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as,

What did you learn about in today's training?

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by

writing back, thus beginning a dialogue between the Trainers and the trainee supervisors. as references for further reading.

******Day 8 End***

DAY 9

CONCEPT: Observation & Classroom Management

Guidelines for the Facilitators: The following section contains details about the skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcome:**
● Understanding of the National Education Strategic Plan (NESP) ● Understanding of present school processes of Afghanistan ● Knowledge of school timetable and academic calendar	● Guide and support school administrators and teachers on the development of a strategy to achieve NESP III Goals. ● Create and enable a learning culture with measures and processes that support the development of school staff.

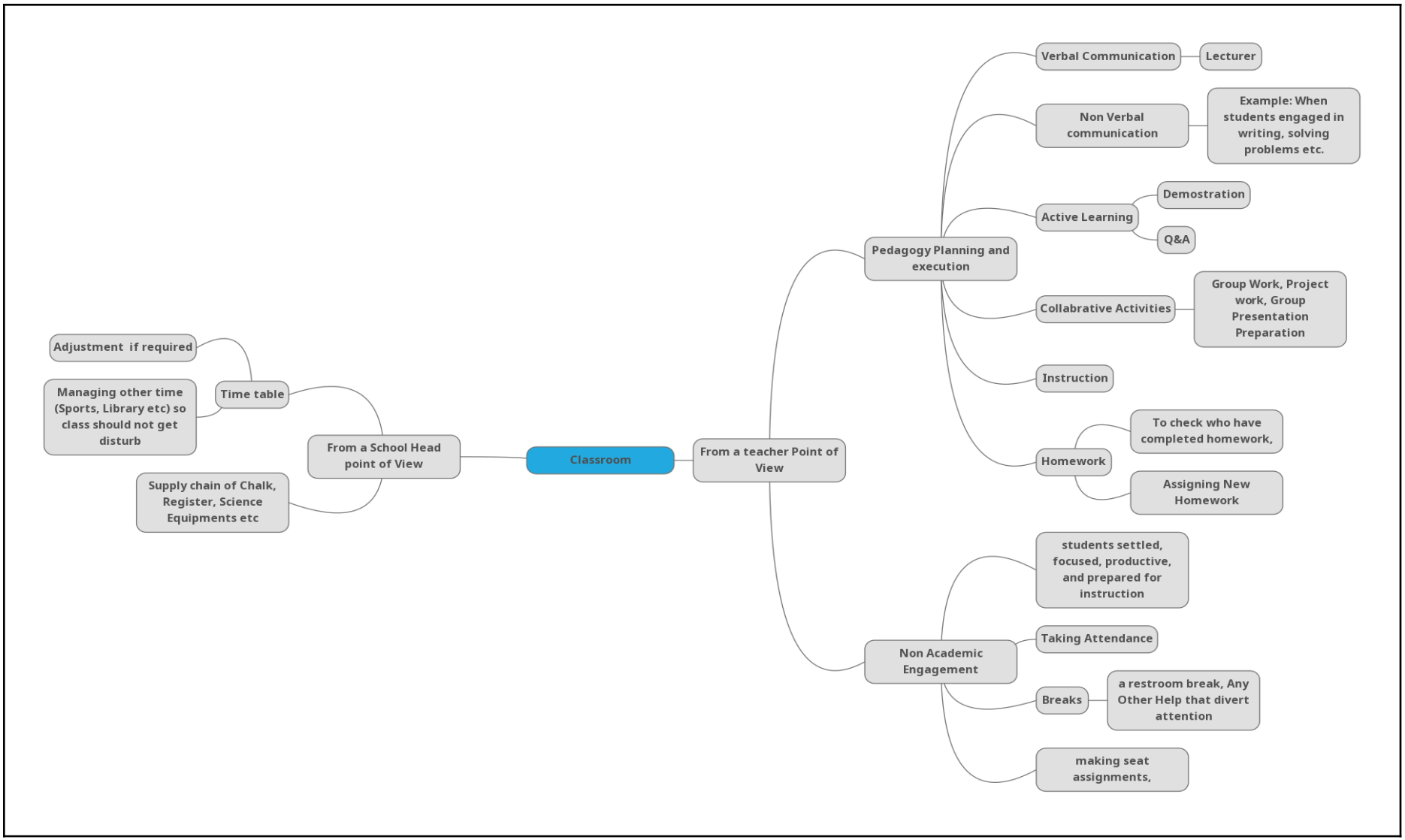
Day	Sub-topic	Concepts	Pedagogy	Time
9	Communicate & Interact Effectively, Developing Self and Others, Critical Thinking, Collaboration with Others,			
	Classroom Management	Communication, Strategic thinking, Classroom Observation	Activity 1: Conceptualize 'what is classroom Management? Understand & be able to utilize classroom Management tools & approaches?	90 Mins
			Break	10 Mins
			Activity 2: To understand the practices/actions we consciously or unconsciously have been engaging in managing the classroom.	90 Mins
			Lunch Break	60 Mins
			Activity 3: To demonstrate critical thinking for managing the classroom effectively.	90 Mins
			Break	10 Mins
			Activity 4: Structured reflection of the day	60 Mins

Activity 1

Objective: to understand What “Management” is required for Managing a classroom.
Output: Participants will be able to understand the strong correlation between academic and nonacademic aspects of managing a classroom.
Resource required: computer, PPT, Notebook and Pen
Notes for Facilitators:

Time: 90 Minutes

- Now let's ask ourselves what different processes and systems we need to manage to enable teachers and students in a learning environment? You may say **Human Resources, Resources, Time, Process, Pedagogical tool, control.**
- Now during your observation of a classroom. Let's break the classroom (40 Mins) into as many tangents as possible. We try to understand the seen and the unseen part of a classroom of 40 Mins. The trainer will instruct participants to think about what goes behind running a successful classroom where teachers are facilitating constructive and participative learning experiences for students.
- Here is the Mindmap: Where we try to understand when we say classroom Management, what is likely to be a classroom Management (for teachers or a head teacher)
- In the below mindmap, you may observe how academic and nonacademic tasks are interacting with each other to make a class possible.


Classroom
From a teacher Point of View
Pedagogy Planning and execution
Verbal Communication
Lecturer
Non Verbal communication
Example: When students engaged in writing, solving problems etc.
Active Learning
Demostration
Q&A
Collabrative Activities
Group Work, Project work, Group Presentation Preparation
Instruction
Homework
To check who have completed homework,
Assigning New Homework
Non Academic Engagement
students settled, focused, productive, and prepared for instruction
Taking Attendance
Breaks
a restroom break, Any Other Help that divert attention
making seat assignments,
From a School Head point of View
Time table
Adjustment if required
Managing other time (Sports, Library etc) so class should not get disturb
Supply chain of Chalk, Register, Science Equipments etc

Small Small Group Activity: What do you understand by the term “classroom management” as a supervisor?

Instruction to Participants:

- Show the mindmap during this activity (slide on the projector)
- Ask them to discuss in their respective small group for 15 Mins,
- Ask them to draw a mindmap on a chart paper (Take any one specific subject, Grade and then design a mindmap)
- After 15 Mins ask them to put their chat paper on the training room wall
- Ask other groups to have a look at this chat paper during breaks.

Reference to the mindmap: The mind map is an attempt to interpret what classroom management looks like. The interpretation is limited and can be explained in many other ways.
Mohammad Fayeq, A. (2015). Interactive teaching in Afghanistan.: Opinions and practice among Afghan Kapisa school-teachers.
Link: Document

Concluding discussion:

- classroom Management is evolving in nature. There may not be a single definition of what classroom management is going to look like. Both academic and non-academic processes evolve over time, Teacher perception, attitude, and knowledge change over time which changes the practices of classroom management.
- Teacher’s attention is a limited resource. Therefore, it is important to create a space where we need to understand how teachers' time is divided in the classroom and how we can support teachers' time and efforts in creating constructive learning experiences.
- Points to reflect on while thinking about classroom Management as an academic supervisor:

❖ Learner Agency, Teacher Agency
❖ Pedagogy, Transaction, Active Learning
❖ Interaction (use of Language, eye contact, gestures, attention, or misbehaving)

- ❖ Content (Subject, Topic, Concepts, Examples, Assessments)
- ❖ Time

Homework: How would students like to manage their own classroom Processes? (discuss with a school-going child to understand his/her perspective)

Activity:2

Objective: To understand the practices/actions we consciously or unconsciously have been engaging in managing the classroom.

Output: Participants will be able to reflect on certain actions to manage a classroom.

Resource Required: Whiteboard, Computers, PPT, Notebooks, Chart paper, Sketch pens

If the computers, Whiteboard etc are not available, Writedown the activity on the blackboard/Share the photocopies of the activities with Participants.

Trainer's Instruction to participants:


Time -90 Minutes

- In the first column is the list of learner behaviour that participants are likely to encounter during the classroom. Ask the group to Devise strategies or actions to address each disruptive behaviour and record them in the second column.
- Participants will discuss in their small group and come up with solutions. (10 Mins for internal Discussion + 5 Mins for large group Sharing)

Activity

The purpose of implementing classroom management strategies is to enhance school and teachers' efforts to create, use and maintain constructive learning spaces for student learning.

	Some areas of improvement found in classroom Observation	**Strategies to support teacher after observation**

Caselet 1	• Maximum students engage in the side conversation during classroom session and teachers did not pay attention to it apart from instructing them to keep quiet	
Caselet 2	• In one classroom, only two to three students continuously answer teachers' questions, answers it perfectly. Teachers are very content to listen to only these students and move forward in their lesson facilitation without addressing the rest of the students whether they have understood or they need further support.	
Caselet 3	• The classroom has 5 female students and 20 male students. The female students are learning all the concepts taught in the classroom, but in multiple observations, it is found that they do not participate and express themselves in the classroom. The teacher identified this problem himself/herself but could not find a solution for encouraging participation and is therefore seeking your help**.**	
Caselet 4	• The teacher has prepared the lesson well and students are learning and participating. While the class is running smoothly, the teacher is habituated to making inappropriate remarks (related to gender, class and background) to students while addressing them.	
Caselet 5	• **I**n your classroom observations in a school, you have observed all the teachers over a period of time. They understand your feedback and work on it and show improvement. In staff meetings, they share that though they are happy to get some feedback from you and in school, there is no acknowledgement of their best practices. The headteacher of the school is totally detached with classroom learning processes and does not support teachers in any initiative.	

Trainer Note:

The trainer will give participants these cases in small groups to identify the strategies or action plans to resolve these areas. The trainer will display one case after another to a larger group and receive different group action plans and strategies on each caselets with their rationale to back their solution. The trainer then facilitates the discussion by establishing that these observation pointers may be the same or similar in their experiences, but the solution for classroom and school management will be different depending on the seen and unseen aspects of that particular school.

Concluding discussion:

The caselets discussed so far are derived from the general observation of classroom Management while observing we generally focus on subject facilitation and student learning. It is our responsibility to observe classroom learning experiences holistically and therefore have observation based on discussions with respective stakeholders to improve overall classroom Management in a school. For example:

- How to ensure gender & disability inclusiveness?
- How to ensure students' participation and knowledge construction in the classroom instead of teachers' directive teaching?
- How to ensure that teachers and other school staff discuss their problems on a monthly basis and identify solutions collaboratively for ensuring student learning?

Activity 3

Objective: To demonstrate critical thinking for managing the classroom effectively.

Output: Participants will have the opportunity to intervene for better classroom Management.

Resource required: Computer, PPT, Projector, Notebook, Pens, chart paper, Sketch Pens

Instruction to Participants:

Time -90 Minutes

- Read the Activity sheet.
- Discuss in small groups: Do you believe that the mentioned strategies will work? If you are observing the class & you observe learners' behaviours/misbehaviors, then what suggestions/Feedback will you provide to Teachers?
- In the first column is the list of learner behaviour that participants are likely to encounter during the classroom.
- Ask the group to advise/choose the best strategy option to address each disruptive behaviour
- Participants will discuss in their small groups and come up with solutions. (5 Mins for internal Discussion + 5 Mins for large group Sharing)
- Trigger Questions during discussion
- ❖ Trigger Question 1: If the children are from grades 1-5, Grade 6-10, do you intervene differently? If yes then ask why?
- ❖ Trigger Question 2: Do you change your strategies if all the students are girls? If yes then ask why?
- ❖ Trigger Question 3: if you are teaching any specific subjects like religious subjects, maths, Science, or Language… Do you think you will change or modify your answers?

	Learner's Behaviour in a class	Teacher's intervention (Suggested Strategies) Participant may add other Strategies

1	Student Engages in the side conversation	● Behave as if you know the side conversation in class related and ask the participants to add their thoughts ● If you are lecturing or leading a discussion, slowly move into the parts of the room where the disruptors are; continue to lecture or discuss and don't look at them as you continue. ● Change the pace of the activity, do something dynamic and playful. ● Re-form the groups, and separate the disruptors. ● At the start of the session, Revisit the classroom rules.
2	A student talks too much even after the teacher requests her/him to quit several times.	● If the learner is on the subject, begin talking with him or her and summarize the learner's point. Then turn to others and invite their participation: "What does everyone else think?" ● Avoid making eye contact for a while. ● If he or she is off target, say, "Great point, but it's beyond the scope of our class…. Let's talk about this outside class" ● Change the pace of the activity and ask students to lead the class for a short time. (by asking her/him to share a story, allow her/him to access the blackboard, Stop the lecturer for some time and engage with him/her on sports, Play etc.)
3	One Child Complains Against Another during the middle of a classroom session.	● Ask if others feel the same way, if they don't then offer to assist or listen to the disruptor during the break. ● If others do feel the same way, facilitate 'productive tangents' ● Acknowledge the complaints, then turn the group discussion to strategizing how to overcome them. ● Writing the issues on the flipchart, and discussing the possible solutions. ● If the complaint is valid, incorporate it into the action planning to have the learner address

		the issue.
4	Student Daydreams; Is not really in the class.	● Change the current activity to make it more dynamic. ● If more than one student, then acknowledge it. Allow a short discussion with students. Ask how the class could be better.
5	Student Heckles teachers	● Give the learner your attention in a learning-orientated way rather than encouraging the heckling. ● Change the activity so that the participants are interacting with each other rather than with you. ● If heckling continues, talk privately to the student. ● If the behaviour still continues, Then it's time to discuss with the headteacher and escalate this issue to discuss with Parents.
6	Challenges: If the students came prepared to the class and answered all teacher questions. Not giving opportunities to other students.	● In this case, ask the student to be the collaborator in your teaching. ● Create opportunities for the learners to participate in pairs or in small groups. You Remember, Zonal Proximal Development, Peer Learning…. It works. ● What would you Suggest?
7	Tell jokes around at inappropriate times in the middle of a session.	● When the joke is funny and told at the right time, Laugh! ● Give the learner attention by re-engaging him or her in the content without acknowledging the joking behaviour. ● What would you Suggest?

concluding Discussion:

- From the above discussion, we found that there is no one solution to manage a classroom. It evolves with teachers' experiences, Pedagogical innovations, Teacher-student engagement & Relationships. There are many other factors that affect a classroom.
- Whatever we do, act, speak and react inside a classroom, students imitate that. So discussion around that act with teachers gives an opportunity to reflect and make meaning out of it. It helps to rectify, improve, and sometimes unlearn.
- Before concluding the discussion let's reflect on the following when you visit the school next.
  - ❖ What are the rules for teachers communicating to students in a classroom and why?
  - ❖ How are our outcomes established due to our response?
  - ❖ What learning environment are we creating for our students?

In the next activity, we will go through classroom observation forms.

Activity 4: Structured reflection of the day

Objective: To provide feedback and input to stakeholders for effective education delivery and other educational services.
Output: Participants will be able to fill out the observation form (collect Data, provide meaningful feedback to peers and share data with Authority)
Resource required: Copies of Classroom observation forms, Computer, PPT, Notebook, Whiteboard, Sketchpens
Structured reflection (25 mins + 35 mins)

Time- 60 Minutes

Notes for Trainer:

- Trainer will distribute the classroom observation forms to all participants and ask the participants to read the observation template.
- The participants will end the day with a structured reflection around classroom observation forms (Both General and Academic).
- Trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on.
- To conclude the structured reflection session, participants and trainers will engage in an interactive diary session throughout the 10 days of training.
- Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training.
- First, it will include supervisors' voices in the training process.
- Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors.

Trigger Questions

1. What did you learn about in today's training?
2. How will today's activities help you in filling classroom observation forms? (Refer to classroom Observation)

List down various observation indicators

- academic and nonacademic indicators that affect classroom Teaching.
- Indicators related to Room Setup
- Indicators related to Availability and usage of Media, Artifacts, Teaching learning Materials, and Toys
- Teacher Physical presence (Voice, Non Verbal behaviour, Body Language, Posture, Dress, Appearance)
- Teacher's Articulation of an Example (Demonstrations, Examples, Facts, Exhibits, Analogies, Testimonials, Statistics)
- Are textbooks being used? For what purpose and when?
- Is a timetable being followed? Is there a structure for the day/time? What is this?
- How does the teacher interact with children? What is the language used? What type of pedagogical interactions and support is she/he providing? Does she/he sit in one place or does she/he move around?
- How are the children sitting? Groups or Rows or Arc —describe the type of groups that have been formed.
- How do the children interact with each other? Are they giving each other academic support?
- Do children approach the teacher? For what purposes

4. Teachers use multiple Active learning teaching methods to engage students. Some of the active learning methods we learnt in this training (Day 3,4,5,6,7). (Example: Suppose we are observing a science teacher using Hands-on Science and case study methods together), then where we capture that process in the given observation form.

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries

by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors. as references for further reading.

----------Day 9 End----------

DAY 10: Wellbeing

Guidelines for the trainers: The following section contains details about skill sets and teaching aids required to conduct the training session along with references for further reading.

Required trainer skill set:	**Expected Outcomes:**
● Understanding of Inclusive School System ● Understanding of NESP III goals and Principles.	Create an environment in schools/classrooms where everyone feels accepted, confident, cared for and concerned about each other's well-being

Day	Sub-topic	Concepts	Pedagogy	Time
10	Competencies: Develop Self and Others, Communication (Verbal and Written), Influencing, Coordinating with Others			
	Emotional Well being, Social Well Being		Activity 1: Why is Perspective Talking Crucial in School/ Classroom?	90 Mins
			Break	10 Mins
			Activity 2: Positive Attitude towards Self and Others	90 Mins
			Lunch Break	60 mins
			Activity 3: Empathy	90 Mins
			Break	10 Mins
			Activity 4: Child Protection & Safeguarding Policies and Guides	90 Mins

			Activity 5: Structured Reflection	90 Mins

Activity 1: Why is Perspective Talking Crucial in School/ Classroom?

The objective of the activity: To understand others with whom one interacts as well as perceive varied situations at home, school, neighbourhood and in life.

Resource Required: Computer and Projector, Notebooks & Pens for Participants.

 Time -90 minutes

Activity:

- Think of any word (Like Religion, masjid, prayer, festival, Family, Friend etc). Share what comes to your mind immediately. How will you feel if someone shares something about it, which is very different from what you shared? What could be the reasons for this difference? Share your reflections.

Procedures to conduct this activity:

- Trainer will show the 1st Activity Questions on the whiteboard/Screen. Ask the Participants groups to discuss in their small group for 15 Minutes.
- All participants will get 2 Minutes to share their understanding.

Notes for Trainer:

- Encourage every participant to talk and express themselves.

Concluding Discussion: (Trainer will explain to the class)

We all see things differently. How we perceive events, situations, verbal utterances, etc. depends on the individual's age, personal experiences, education, and social, cultural and economic background. All these together develop patterns of thinking, acting, responding, and approaching situations in a particular manner, which become our mental inclinations/preferences to approach people and situations. It is this tendency (or mental set) that provides a framework to understand others with whom one interacts as well as perceive varied situations at home, school, neighbourhood and in life.

Perspective-taking is the ability/competence to see situations from another person's point of view. It encourages us to listen to and comprehend others' point of view, recognise and understand others' emotions, thinks of an alternate reality, visualises things from a new point of view, be empathetic, actively seek solutions in conflicting situations, and works with compassion and with team spirit. In other words, perspective-taking ability forms the base that helps an individual to be sensitive and caring, show respect and appreciate others' thoughts, emotions, actions and circumstances. In school as well as in a classroom situation (including a virtual classroom), when both teachers and students transact with such a base on understanding and appreciating each other's perspective, it contributes to a healthy classroom and school environment.

Activity 2: Positive Attitude towards Self and Others

Objective of the activity: To facilitate having a positive attitude towards own self and towards others,

Resource Required: Computer and Projector, Notebooks & Pens for Participants.

 Time -90 Minutes

Activity Questions:

- Write down the name of someone you think typically has a good attitude. What about them makes you think that?
- When you think of a person with a bad attitude, what things or who does that person usually point to as the reason they are in a bad mood?
- Do you think you can have a bad attitude one day and a good one the next? Why or why not? What influences that?
- Do you have to have a bad attitude if things aren't going your way or do you think it's possible to have a good attitude even when bad stuff is happening? Tell me why.
- Are there things in your life you'd like to change to help you have a more positive attitude?
- If negative stuff is happening to you, are there things you can do to keep your outlook positive? Name a few of them.

Procedures to conduct this activity:

- Trainer will show the Activity Questions on the whiteboard/Screen. Ask the Participants groups to discuss in their small group for 30 Minutes.
- All groups will get 5 Minutes to share the summary of the discussion.

Notes for Trainer:

- Encourage every participant to talk and express themselves.

Concluding Discussion: (Trainer will explain to the class)

As one matures and moves towards higher grades, learners begin to face the need to deal with everyday stressors, such as not being as beautiful/ handsome as their favourite person from the world of films/ sports, having doubts about being liked or disliked by peers, pressure to be accepted in the peer group and receive their appreciation, performing well in academics and not knowing how and what career pathways to explore for oneself. For a Variety of reasons, stress is caused due to pressure from parents, family members and other significant people in their lives to do well in every aspect of life. Besides dealing with these stressors, adolescent learners also have to face many conflicts with parents, family, peers and with their own selves. These stressors and conflicts create hurdles for the students in the high school/higher secondary schooling stage.

To ensure that adolescent students in the second stage are able to meaningfully engage in learning, it is important that they learn to deal effectively with the stressors, learn the skills for resolving conflicts with family, friends and with self, manage their emotions effectively, etc.

To facilitate students in the second stage to have a positive attitude towards their own self and towards others,

- teachers need to be optimistic and foster a positive attitude within themselves and towards others, including their students. Being a role model for the students,
- a teacher's positive attitude plays a crucial role in developing the same in the students. There is a need for adequate display of care, concern, and respect not only for students but also for colleagues and other people working in the school environment as well as towards parents and family members of students.
- Sharing with the secondary stage students how they deal with their everyday stress and conflicts, and their experiences as students during adolescence are some of the ways through which teachers can extend support and facilitate students. Some of the qualities that highlight one's positive attitude towards self and others are feeling/seeing the good in oneself and others, taking initiative and leading others, being cooperative, being compassionate, being sportive, etc.
- As a teacher of adolescent students in the second stage it is important that we help the students see good in themselves, explore and identify their strengths and at the same time identify areas where they need to make efforts to improve.

Activity 3: Empathy

Objective: This exercise may be done in a training session to help Participants to be empathetic towards each other.

Resource Required: Computer and Projector, Notebooks & Pens for Participants.

Time -90 Minutes

Activity: You come to know that a student who used to perform well in studies and participate in many school activities, the goal is to become an eye doctor and help others. He is now not doing well in his studies and not talking to his teachers and classmates like before. On enquiring, you find out that the student is worried about the future as his family is not doing well financially and the student is under pressure to start earning at the earliest. His old father asked him to support his store.

- What is your feeling for this student and why?
- What would you suggest the student do?
- If you were in the student's situation what would you do?
- Suggest a few strategies to the education department regarding supporting students to fulfil their aspirations.

Procedures:

- Trainer will show the Activity Questions on the whiteboard/Screen. Ask the Participants groups to discuss in their small group for 30 Minutes.
- All groups will get 5 Minutes to share the summary of the discussion.

Concluding Discussion:

Empathy is the ability to understand the feelings of another person from their perspective. It is like putting yourself in the other person's shoes. A

student's frustrations, anger, helplessness, indifference, fear and all other such emotions will become more apparent when you empathise with them. It is this skill, which makes students feel that you are able to identify with their problems without feeling sorry for them.

The skills associated with empathy are: **Verbal and Non-verbal Communication of Attentiveness**

- Communication of empathy would begin with being with the person totally, both physically and mentally. Attentiveness needs to be communicated both verbally and non-verbally so that the student is sure you are with the student.
- Words such as 'go on, 'uhn-ahn', and 'hmm', along with head nods indicate verbal attentiveness. Verbal attentiveness puts the teacher in a position to listen carefully and also enhances the feeling of being understood.
- Non-verbal attentiveness is communicated through facial expressions, hand gestures, body postures along with the tone of voice. These are useful means of communicating any message.

Keeping Pace with the Student's Mode of Experience

Another way of communicating empathy is to match or keep pace with the student's way of interpreting or expressing an experience. Trying to keep pace with the student's experiences through their words, voice tone, eye movements, etc. and responding in the same vein helps to communicate empathy. Paying attention to the language and type of words frequently used by a student can be helpful in understanding what sensory modality is being used. For example, if one is frequently using expressions such as 'I see what you mean, 'it shows' or 'it is clearly visible, it indicates that the person is using visual modality in the expressions.

Activity 4: Child Protection & Safeguarding Policies and Guides

Objective of the activity: To help participants understand and work towards realising the rights of all children, their protection and Safeguarding practices.

Resource Required: Pens and Papers for Participants

 Time -90 Minutes

Procedures:

- Trainer will show the Baseline Questions on the whiteboard/Screen. Ask the Participants to discuss in their small group for 30 Minutes. Each individual will Write Down the takeaways in their notebook.
- After discussing the questions in the small group, the Trainer will ask them to read the document (Save the children's SCI POLICY: CHILD SAFEGUARDING, Definition Page 8,9, 10)
-

Baseline/After Activity Questions: (All Participants need to write the answers in their Handbook)

1. Are you familiar with the types of abuse that children might be subject to, including in their families, communities and schools?
2. Do you know the correct procedures for dealing with child abuse? Do you feel confident to deal with any issues which arise, including disclosures of abuse?
3. Has due consideration been given to ensuring the children feel comfortable making disclosures and expressing any concerns they may

have? For example, in your project, it may be important that girls work with a female teacher. This is not always the case so do what is best for your context.

4. In the interests of building trust and developing children's participation in child protection, is the School able to work with the children over the medium to long term?
5. Do you believe that the children's parents understand the topics being discussed?
6. Are the activities happening in a place where children feel safe, where they know each other and where they trust the adults involved?
7. Do you have enough support to monitor the children's responses and manage any emotional reactions to the topics discussed?
8. Have you planned for sufficient introduction and trust-building activities to ensure activities are meaningful and helpful to the children involved?

Reading Activity: Save the children (Child protection and safeguarding Policies and Guides)

Link to the document:
https://www.savethechildren.org/content/dam/usa/reports/events/child-safeguarding-policy-2020.pdf#:~:text=Save%20the%20Children%20has%20been%20built%20on%20the,and%20then%20report%20and%20respond%20whenever%20concerns%20arise.

Concluding Discussion:

Safeguarding is the action that is taken to promote the welfare of children and protect them from harm. Safeguarding means:

- protecting children from abuse and maltreatment
- preventing harm to children's health or development
- ensuring children grow up with the provision of safe and effective care
- taking action to enable all children and young people to have the best outcomes.

Child protection is part of the safeguarding process. It focuses on protecting individual children identified as suffering or likely to suffer significant

harm. This includes child protection procedures which detail how to respond to concerns about a child.

Activity 5: Structured reflection of the day

Time -90 Minutes

The participants will end the day with a structured reflection session. The trainer will ask them to list out two ideas/ skills/ strategies that were most useful for them in today's training, and one idea/ skill/ strategy that they need clarification on. + Multiple Trainers will answer questions in small groups for the supervisors, ensuring that everyone gets time to share in their groups.
All the structured reflection sessions can also be used for further contextualization of the learning. Participants can reflect on the skills and strategies they learned, challenges they see with the existing supervision system, and how best they can be used to improve on them.
It is up to the trainer's discretion on how they want to proceed.
To conclude the structured reflection session, participants and trainers will engage in an interactive Diary session throughout today's training. Interactive dairy is a strategy to include the supervisors' voice in the training. In an interactive diary, the trainees get to give live feedback on the design of the training that they are undertaking by engaging in a dialogue with the trainer. Other than this, there are two reasons to include interactive diaries in this training. First, it will include supervisors' voices in the training process. Second, it builds a transferable skill in the supervisors that they can use when they are working in the field with their supervisors. The Trainers will see trainees as valuable contributors in their development as supervisors, and trainees get to actually comment on their training to make it their own. Interactive diaries Material required: Any notebook and a pen.
The diaries will be distributed to the supervisors along with the prompts for feedback on the training, such as

- What did you learn about in today's training?

- What does it mean to put yourself in someone else's shoes?
- How empathetic am I?
- How can I better show empathy toward others?
- What makes us different? What makes us the same?
- How am I the same as other people? How am I different from other people?
- What are the differences between how I live and how others live?
- Can people who share my identity still be different from me?
- How can I learn more about other people?
- How can I become more accepting of others?

Supervisors will write their notes for the Trainers in the diaries and then these will be collected. The trainers will respond to the diary entries by writing back, thus beginning a dialogue between the Trainers and the trainee supervisors. as references for further reading.

----------Day 10 End----------

----------Day End----------

The objectives of the training programme: To equip Academic Supervisors on Various GDAS key Competencies like learning outcomes, learner centred pedagogy, new initiatives in education and addressing diverse needs of children through multiple pedagogies, etc.

- To monitor and provide extensive support to the Schools using multiple modes up to the classroom level, in view of improving learning outcomes of the students.
- To orient state functionaries and school principals on learning outcomes,learner- centred pedagogy and new initiatives in school education so that they are able to extend support to schools for the implementation of new initiatives.

Expected Outcomes of the pedagogy and classroom Management Training Program:

- Improvement in learning outcomes of the students.
- Creation of an enabling and enriching inclusive classroom environment
- become alert and responsive to the social, emotional and psychological needs of students as first level counselors.
- To develop and strengthen personal-social qualities of Teachers & students for their holistic development.
- Creation of a healthy and safe school environment.
- Transformation of School Heads into providing academic and administrative leadership for the schools for fostering new initiatives.

Day 1: SCHOOL, CLASSROOM AND LEARNING

Expected Outcome from Session: **1.** Understand the different school process contributing to learning **2.** Understand the importance of school in enabling learning 3. Understanding aims of schooling and its processes

Day 2: Introduction To Learning Theories

Expected Outcome: **1.** Understand the learning theories to approach active learning. **2.** Understand the importance of active learning in classroom Processes.

Day 3: Curriculum subject: Pedagogy of Language

Required trainer skill set: ● **Familiar with Language Pedagogy** ● **Multilingualism**	**Expected Outcome:** 1. Understanding the nature of learning language and its implication in classroom teaching of language.

● **Understanding of diversity in language learning**	2. Supervisors will understand the key attributes of a language learning classroom.

DAY 4: Pedagogy of Mathematics

Expected Outcome After going through this unit, Participants will be able to ● Understand aims of teaching and learning mathematics education. ● Identify the indicators of effective mathematics education. ● Create a conducive learning environment in the school for Mathematization.

DAY 5: Pedagogy of Science

Objectives of the day are to help Teachers in: ● Understanding the nature of science and its place in school curriculum,

- Understanding the importance of scientific temper development among all learners.
- Discussion on various issues approaching gender in Science Education.

Day 6: Pedagogy of Social Science

Expected Outcome:

1. Understanding the core objective of teaching social science in the school.
2. Understanding the skills and prospective social science curriculum should strengthen students.
3. Understanding different pedagogical tools/ methods for social science pedagogy.

DAY 7: Learning objectives and Approach to lesson Plan

Expected Outcome:

1. Understanding on how to articulate learning objectives. with Stakeholders (Teachers, School head, students, Parents)
2. Collaborate with different stakeholders to define, design and implement intervention based on learning objectives.

DAY 8: School Management

Expected Outcome:

1. Continuously learning and demonstrating the ability to solve complex problems.
2. Create effective and innovative solutions around pedagogy.
3. Create learning and growth opportunities for people, processes and institutions.

DAY 9: Observation & Classroom Management

Expected Outcome:

- Guide and support school administrators and teachers on development of strategy to achieve NESP III Goals.
- Create and enable a learning culture with measures and processes that support development of school staff.

DAY 10: Wellbeing

Expected Outcomes:

Create an environment in schools/classrooms where everyone feels accepted, confident, cared for and are concerned about each other's well-being

Useful Sites For Teachers

TESS India – A toolkit of Open Education Resources (OER) in multiple languages
School Water Portal – Resources on Water and related issues
Tactivities – Hands-on Science through making and experimenting
Eklavya – Teaching-Learning Resources in English and Hindi
Storyweaver – Pratham Book's Digital Reading Platform
Firki – Teacher Training Portal
Khan Academy – Free Online Courses, Lessons and Practice
Teacher Plus – The magazine for the contemporary teacher
Arvind Gupta Toys – A rich repository ebooks and videos useful for Teachers
Khan Academy

International

Edutopia – Teaching Learning Resources for K-12
KQED Mindshift – Explore future of learning in all its dimensions
TED Ed – Animation Videos and a Platform for Teachers to create their own Interactive Lesson Plan
Read Write Think – Access to the highest quality practices in reading and language arts instruction
TES Connect – Information, Products and Training teacher's need to succeed, connecting teachers worldwide
Teach Thought – Ideas and resources for K-20 teachers
National Council of Teachers of Mathematics – World's largest mathematics education organization
PBS Education
Project Zero
Connected Learning Alliance

Youtube Channels:

Verisatium
Physics Girl
Numberphile
minutephysics
Bodhaguru
bookboxinc
British Pathe
DSH Online
TESS India
Epified
Exploratorium
FWS – Fun With Science
Khan Academy
School Cinema
Sick Science!
Fixiki
Super Why

INTRODUCTION

TEACHING MULTIPLICATION

Here are some questions which arise while teaching Multiplication: Should children memorise the multiplication tables? What is an easy and convenient way of modeling multiplication? Is it enough if one only teaches the procedure of multiplication? Perhaps answers to these questions can be found if we reflect on the importance we give to construction of knowledge. If we see that children must understand how facts are derived, how procedures are derived and how concepts can be visualized, then our approach will be dictated by that understanding.

Keywords: *Multiplication, manipulatives, pattern, cycle, symmetry, commutative, Cartesian product*

We start with two 'warm up activities' before introducing multiplication (Activity 1 and Activity 2).

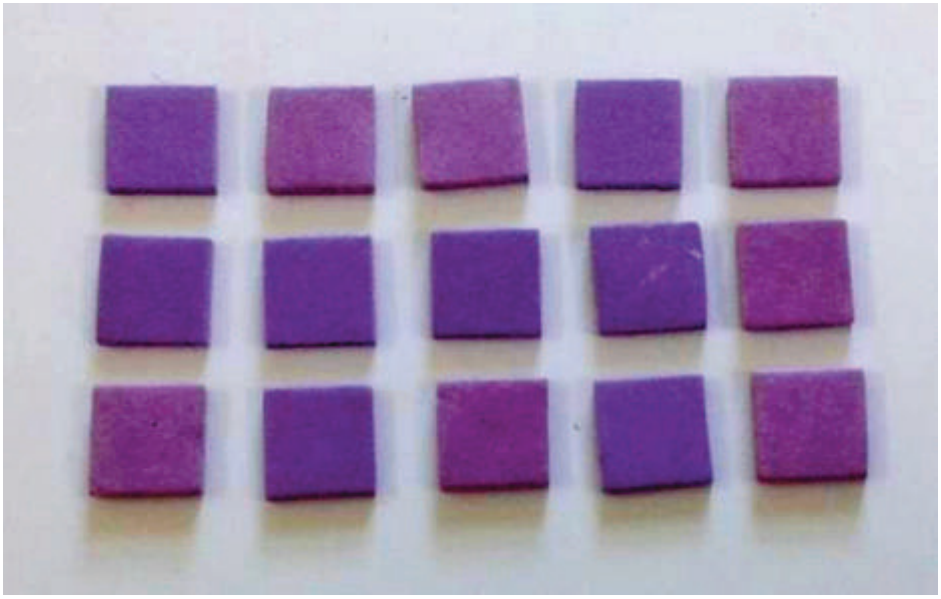
ACTIVITY
ONE

Making equal groups and internalising multiplication contexts

Materials required: Square pieces, straws and rubber bands, coloured buttons. Peg board and pegs or a graph board and seeds

One group of children can work with straws and make bundles of straws with the same number of straws in each bundle. Another group can arrange square pieces in rows with the same number of pieces in each row. Yet another group can line up seeds on a graph board or square ruled sheets. (Seeds can also be placed in paper plates or bowls.) By rotation, all groups should work with different materials. Different children learn in different ways. We need to expose them to multiple ways of looking at things. Also, working with different materials and different arrangements will help children become familiar with different contexts in which multiplication arises. Further, it is important that children of this age group are exposed to tactile learning. This will aid in visualizing problems and strengthen their conceptual understanding. Doing these activities will also help children who learn through a kinesthetic approach.

The purpose of this activity is to focus on re-arranging objects into equal groups and distinguishing between the two numbers (the number of groups made, and the number in each group) arising from the situation. It is not necessary at this point to talk of the total number. Questions will centre around the following: 'How many groups?', 'How many in each group?'



ACTIVITY TWO

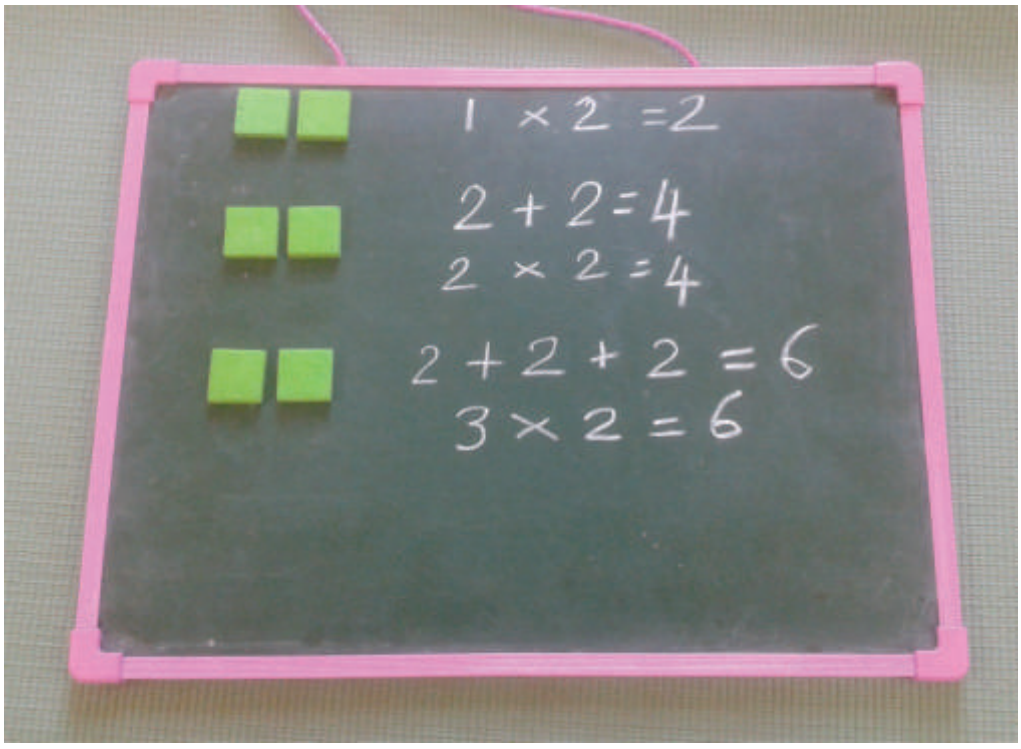
Skip counting in steps of 2, 5, 4 and 10

Materials required: String of beads, number line and number chart

With or without the aid of a number line, children can do skip counting using skips of 2, 5, 4 and 10. They could also try skip counting with other numbers if they are at ease with them. They can do forward counting as well as backward counting.

Here the questions will centre around the following: 'In what steps are we counting?' Say 2. 'How many steps of 2 did we count to reach 10?' Answer: 5 repetitions of 2 have brought us to 10.

It is fun to do this as a hopping activity on a number line drawn on the ground. Children can explore whether they can reach 12 by hopping in steps of 2 or 3, or steps of any other number.



ACTIVITY **THREE**

Introduction to multiplication table 2 through repeated addition

Materials required: Seeds or square pieces

While introducing any multiplication table it is important to construct the table gradually in front of the children, articulating each step clearly.

Arrange 2 squares in a row and say: "This is 1 group of 2 squares." (One two is two, this is written as $1 \times 2 = 2$) Now place 2 squares under them, saying: "This is 2 groups of 2 squares" (two twos are four, this is written as $2 \times 2 = 4$). Now build the third row of 2 more squares (three twos are six, $3 \times 2 = 6$) and so on till ten twos are twenty, $10 \times 2 = 20$.

I prefer to teach multiplication tables as $1 \times 2 = 2$, $2 \times 2 = 4$, $3 \times 2 = 6$, $4 \times 2 = 8$, etc. (changing the first number and keeping the second number constant).It is the group number which increases each time while the group size remains constant. This corresponds to the way we speak about a multiplicative situation: 3 rows of 10 chairs, 4 classes of 20 students, five 2 kg packets of salt, etc.

However, if one prefers to teach the tables as $2 \times 1 = 2$, $2 \times 2 = 4$, $2 \times 3 = 6$, etc., then while arranging the squares in successive rows, one will have to say: 'two occurring once is 2, $2 \times 1 = 2$', 'two repeated twice is four, $2 \times 2 = 4$', 'two repeated thrice is six, $2 \times 3 = 6$', and so on.

Whichever approach one takes, one needs to proceed gradually, stating the number that is repeated and the number of times it is repeated.

Also, let children record their activities as drawings (as shown in the picture for Activity Two). It is important that they record the result both as a repeated addition and as a multiplication fact, in both forms till they internalize the relationship between repeated addition and multiplication.

Usage of 'into': For some reason, while reciting multiplication tables, the usage of the word 'into' has crept into our language ("2 into 4 equals 8"), but this is not appropriate. In fact, when one asks,"How many times does 2 go into 4?" it actually means *division* (4 divided by 2), and the answer is 2. We need to change this practice and read multiplication facts as "3 times 2 equals 6", "4 times 8 equals 32", etc.

Multiplication tables for 5, 4 and 3 (I prefer to teach the tables for 2 and 5 first) can be introduced in a similar manner. It is good to pause at this point and spend time consolidating these facts before we go on to further multiplication tables.

ACTIVITY
FOUR

Patterns in multiplication tables of 2, 3, 4 and 5 as an aid in committing the tables to memory

Materials required: Multiplication Tables chart with bold numbers, number chart (1 to 100)

Discuss with the children the patterns seen in the multiplication table of 5. They can first look at the numeral in the units place and observe that 5 and 0 repeat in a cycle of 2. They will also notice that in the tens place, each number appears twice.

Next they can work on the pattern in the multiplication table of 2. They will see that numerals 2, 4, 6, 8, 0 repeat with a cycle of 5. But in the tens place, the pattern does not establish itself unless they build the table further. This is a good point to show an extended multiplication table (which we normally do not attempt).

Now they can work on the pattern in the multiplication table of 4. They will see that the numerals 4, 8, 2, 6, 0 repeat in the units place with a cycle of 5. What about the pattern in the tens place? Do we need to extend the table to notice a pattern? Is there any relationship between the sequence of digits in the units place of 4 table and the sequence of digits in the units place of 2 table?

Finally they look for patterns in the multiplication table of 3. The patterns can be found more easily if we group the digits of the units place in groups of three and place them in rows under one another:

3 6 9

2 5 8

1 4 7

Children will see that the digits of the first, second and third columns decrease by 1 each time.

Should Multiplication Tables Be Memorised?

First: Children should have plenty of exposure to the concept of multiplication and internalize it.

Second: Children should be able to build or construct any multiplication table with understanding.

Third: Usage of aural memory or visual memory in learning and memorising the multiplication tables of 2 to 10 is very useful in mental arithmetic and saves a lot of time.

Multiplication tables have also been set to tunes and are available in the market and on the internet as songs. It will help children who are musically inclined.

Many teachers either skip or rush through the first two steps in a cursory way and get children to memorise tables. This will not lead to an understanding of the concept and makes the child helpless whenever his memory fails. The capacity to build a table is enabling and empowering to the child.

Also, there is no need for panic if some children take more time to memorise. We want children to think in mathematical ways and not merely learn by rote. It is therefore advisable that we give a lot of attention to the proper understanding of this concept.

ACTIVITY
FIVE

Constructing tables from 6 to 10

Materials required: Broom sticks or cardboard strips or plastic tongue cleaners

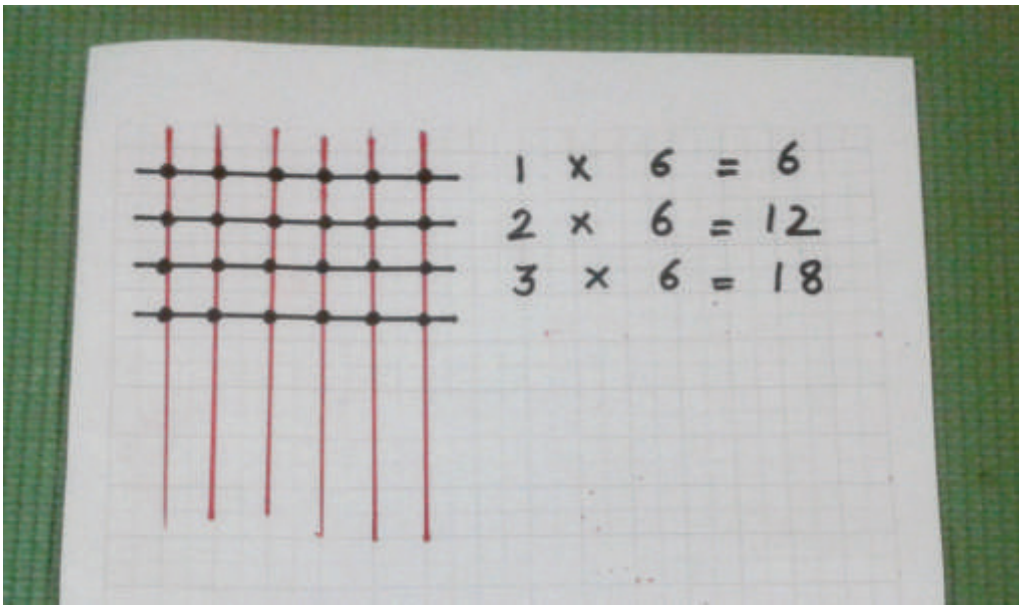
Multiplication facts for 6, 7, 8 and 9 can be taught using any of the following methods.

- Repeated addition, using seeds or buttons
- Arranging square pieces in array form (rows and columns)
- Counting the joints of intersecting lines

The third approach has the advantage of being less cumbersome than the first two methods when one is constructing a multiplication table for a larger number. It is also easier for children to make rough sketches of it in their notebooks.

Arrange 6 strips parallel to one another vertically. Lay one strip horizontally across them and point out the joints where they intersect and say $1 \times 6 = 6$. Lay one more strip horizontally across the vertical lines, point out the joints where they intersect and say $2 \times 6 = 12$. Lay one more strip horizontally across the vertical lines, point out the joints where they intersect and say $3 \times 6 = 18$, and so on.

Once children have understood the process by which they have created the multiplication table for 6, they will be able to do the same for 7, 8 and 9 on their own and work out the multiplication facts.



ACTIVITY SIX

Noting the patterns in multiplication tables of 6, 7, 8, 9 and 10 as an aid in committing the tables to memory

Materials required: Multiplication Tables chart with bold numbers, Number chart (1 to 100)

The pattern for table 10 is obvious.

Discuss with children the patterns they notice in the multiplication table of 9. It has many patterns and there is a lot that children will be able to discover on their own if the teacher poses some leading questions.

Finger pattern showing $9 \times 4 = 36$

Finger pattern showing $9 \times 5 = 45$

They can first look at the numeral in the units place and see that it goes down from 9 to 0. At the same time, the tens place increases from 1 to 9. The digits of the number always add up to 9. The units digits have a cycle of 10 before they repeat. The table can be demonstrated using the fingers of both hands in a simple fashion by progressively raising the first finger, followed by the second, etc, and reading tens from the left side of the raised finger and units from the right side of the raised finger, as shown in the figure.

They can now look for patterns in the multiplication table of 8. They will see that 8, 6, 4, 2, 0 repeat in the units place with a cycle of 5. But in the tens place, the pattern does not establish itself unless they extend the table further. Is there a relationship between the sequence of the digits in the units place of the 4 table and the sequence of digits in the units place of the 8 table?

Now they can work on the pattern in the multiplication table of 6. They will see that numerals 6, 2, 8, 4, 0 repeat in the units place with a cycle of 5. What about the pattern in the tens place? Will we need to extend the table to notice a pattern?

Finally they can look for patterns in the multiplication table of 7. The patterns can be easily found if we group the digits in the units place in threes and place them in rows, one below the other (like we did in the case of multiplication by 3):

7 4 1

8 5 2

9 6 3

The digits of the first column, second column and third column are seen to increase by 1 at each stage.

ACTIVITY SEVEN

Creating visual patterns using multiples of 2, 3, 4, 5, 6, 7, 8, 9

Materials required: Square grid paper, 8 sheets per child

Ask the children to write the numbers from 1 to 100 with a pencil in a 10 by 10 square grid.

Let them colour the multiples of 2 in their grids and note the pattern that emerges.

Let them write 1 to 100 again on another 10 by 10 square grid and this time colour all the multiples of 3. This creates a diagonal pattern.

They can repeat this exercise for other numbers 4 to 9 on different square grids.

Discuss the patterns that emerge.

ACTIVITY EIGHT

Discovering commutativity, associativity and distributive property of multiplication

Square grid paper, cardboard strips

COMMUTATIVITY

While we want children to discover these three properties of multiplication, we can avoid mentioning the names to young children and demonstrate only the property.

Let children make 5 groups of 3 seeds. Ask them what number this gives. Record the answer 5 x 3 = 15.

Let them now show 3 groups of 5 seeds. Ask them what number this gives. Record the answer 3 x 5 =15.

Ask them: "Is 3 groups of 5 each the same as 5 groups of 3 each?" What is common? It is the answer which is common.

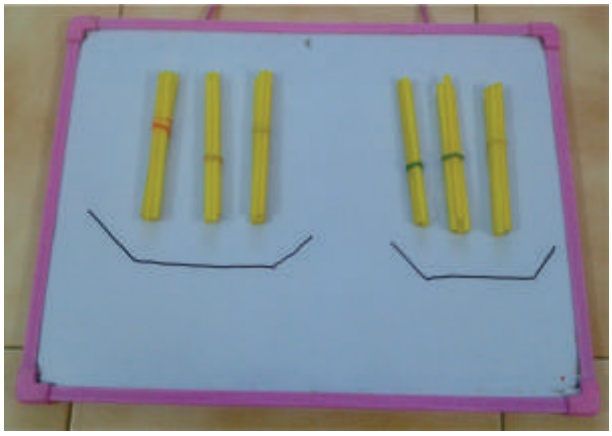
Let children colour a row of 6 squares. Let them make 3 such rows. They can now record what they have coloured.

3 rows of 6 squares equals 18, i.e., $3 \times 6 = 18$.

Now ask them to turn the drawing through a right angle to make it vertical. Ask them to describe the number of rows that they see now.

They see 6 rows of 3 squares. So $6 \times 3 = 18$.

Now point out that 3×6 gives the same result as 6×3.



ASSOCIATIVITY

Ask children to bundle 4 straws together using a rubber band. Let them make 6 such bundles. Place them equally in two plates (i.e., 3 bundles in each plate). Now let us count the total number of straws.

There are 2 plates, 3 bundles in each plate, and 4 straws in each bundle.

The total number of straws can be calculated as the number of bundles times number of straws in each bundle, i.e., $(2 \times 3) \times 4$, or as the number of plates times the number of straws in one plate, i.e., $2 \times (3 \times 4)$. So: $(2 \times 3) \times 4 = 2 \times (3 \times 4)$.

DISTRIBUTIVITY

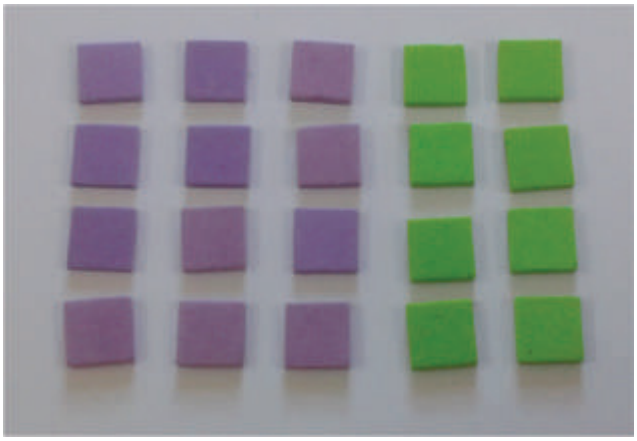
Let children colour the squares as shown. Let them state the multiplication fact for the purple squares (4 rows of 3 squares each, $4 \times 3 = 12$) and green squares (4 rows of 2 squares each, $4 \times 2 = 8$), separately.

Next, let them state the multiplication fact for the whole region: 4 rows of 5 squares each, $4 \times 5 = 20$.

Hence:

$(4 \times 3) + (4 \times 2) = 4 \times (3 + 2) = 4 \times 5 = 20$.

Several examples of each type need to be shown using various contexts and numbers for the three laws to be understood.

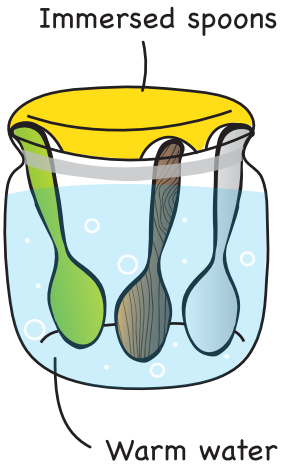


The Science Lab

CONCEPT BUILDER: IS METAL COLDER THAN WOOD / PLASTIC?

Imagine:

A metal spoon, a wooden spoon, and a plastic spoon are placed in hot water for half a day. The water is maintained at the same temperature throughout.



Predict:

At the end of the experiment, the spoons are taken out and their temperature is measured immediately. Which of the following is likely to have the highest temperature?

- The metal spoon
- The plastic spoon
- The wooden spoon
- All three spoons will have almost the same temperature

Explain:

Your reason for choosing the outcome you predicted.

Discuss:

- How would you test if your response is correct?
- What are some ways to measure and compare the temperature of the spoons?
- Would your answer change if you used a different way? Why?
- What if you also kept a steel spoon in the hot water — which spoon would be the hottest?
- If the spoons were kept in the fridge instead of warm water, which spoon would be coldest?

Contributed by:
Vishnuteerth Agnihotri has worked with Educational Initiatives on improving learning and assessment. His current interests lie in developing an integrated multi-disciplinary curriculum. He can be contacted at: vishnu.agnihotri@gmail.com.
Anagh Purandare teaches science and biology at Rishi Valley School. His current interests lie in integrating different topics to facilitate science learning. He can be reached at: anaghrv@gmail.com.

i wonder...
Rediscovering school science

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The Science Lab

CONCEPT BUILDER: CAN YOU SEE IN A DARK ROOM?

Imagine:

You are in a room which is **completely** dark. The room has one chair.

Predict:

If you were to look around the dark room, which of these is likely to be true? You will:

- Not be able to see anything in the room.
- Be able to see at least a dim outline of the chair in a few minutes.
- Be able to see the chair only after standing in the room for more than a few minutes.

Explain:

Your reason for choosing the outcome you predicted.

Discuss:

- If you knew the chair was yellow in colour, would you search for the chair by its shape or colour?
- How would you test if your response is correct?
- How would you make a room completely dark?

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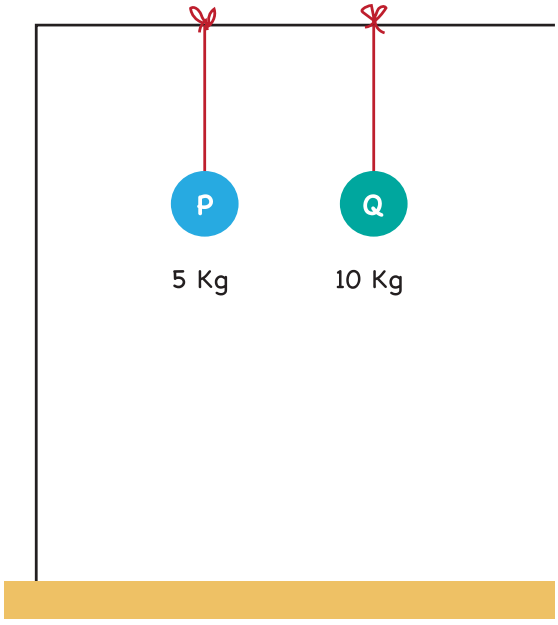
The Science Lab

CONCEPT BUILDER: DO HEAVIER OBJECTS FALL FASTER THAN LIGHTER ONES?

Imagine:

Two balls, P and Q, of equal size but unequal mass (P weighs 5 kg and Q weighs 10 kg) hanging from strings of the same length at a certain height above the ground.



Predict:

The strings are simultaneously cut. Which of them would fall to the ground faster?

- Ball Q because heavier objects always fall to the ground faster.
- Ball P because lighter objects always fall to the ground faster.
- Both would take the same time because the time taken to fall is independent of their mass.
- We cannot say because it would depend on the height from which they are falling.

Explain:

Your reason for choosing the outcome you predicted.

Discuss:

- How would you test if your answer is correct? What everyday objects would you use to replace the balls?
- If the balls were of different sizes, would your answer change? For e.g., if you were to repeat this experiment with a cricket ball and a marble, which would fall to the ground faster? Why?
- If the balls were replaced with objects of different shapes, would your answer change? For e.g., if you were to repeat this experiment with a dictionary (with its pages tied together) and a brick, which would fall to the ground faster? Why?

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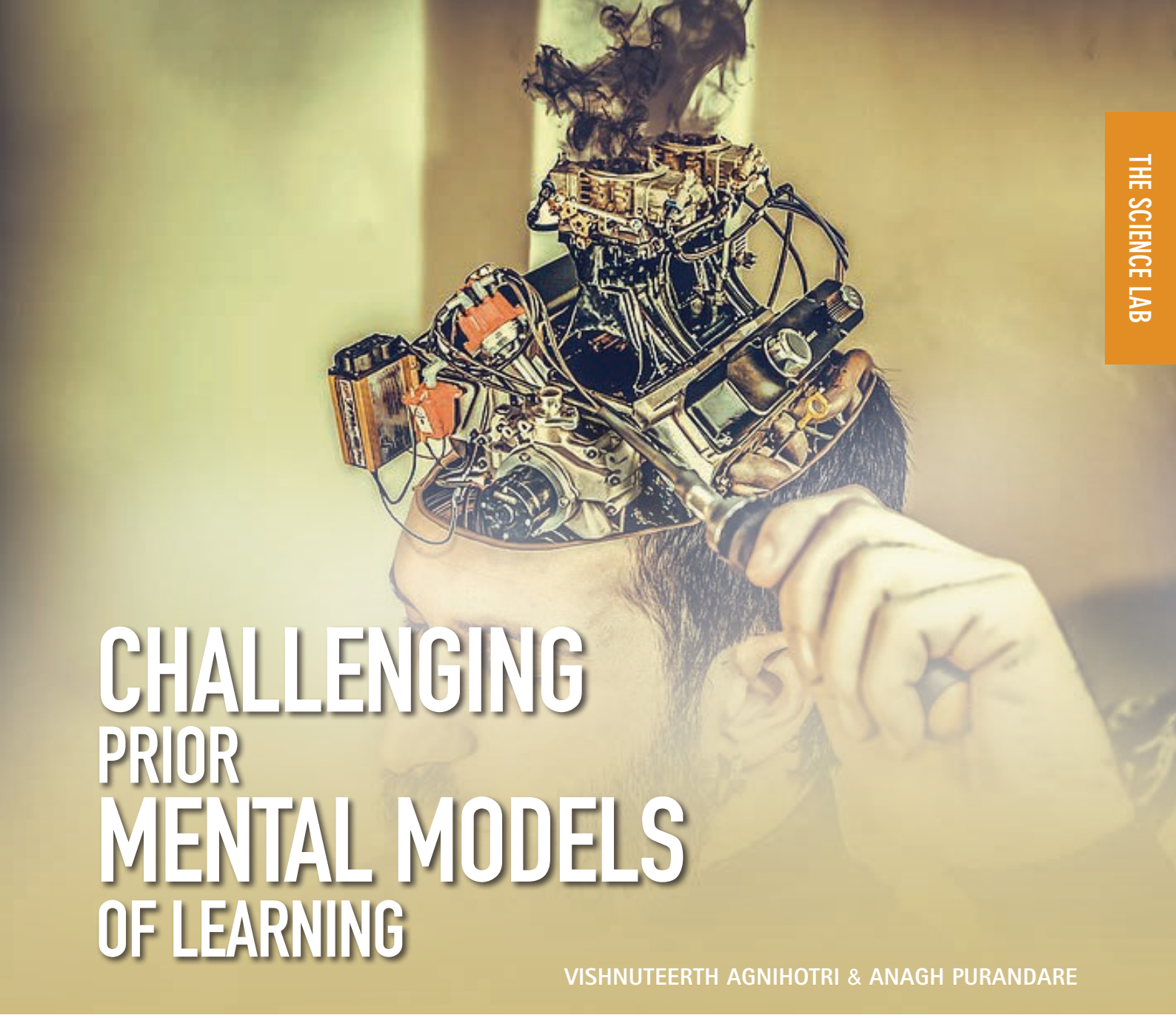


CHALLENGING PRIOR MENTAL MODELS OF LEARNING

VISHNUTEERTH AGNIHOTRI & ANAGH PURANDARE

Children enter the science classroom with 'mental models' of real-world phenomena surmised from their day-to-day experiences. Unchallenged, these models can persist into adulthood. Are these models scientifically accurate? How do we help a learner recognise and replace inaccurate models with scientifically accurate ones?

We learn from our observations of the world around us. A two-year-old may learn that food always falls down by repeatedly throwing it up (to our consternation). Similarly, it is through repeated observation that our mature selves learn that a *dosa* will not stick to a pan at a temperature that is high enough, but not too high. These common-sense learnings from everyday observations are useful and, often, even critical for survival. Are they scientifically accurate? Let us examine this through some examples of everyday phenomena.

A metal coin is colder than a wooden spoon in the same room

We bet many of you believe this statement to be true (you certainly don't want some prankster slipping a metal coin down your shirt on a cold winter day)! But, in fact, the metal coin and the wooden spoon will be at the same temperature. Unless one of them had just been brought in from outside, heated, or taken out from a refrigerator. How is this possible? After all, a metal coin feels so much colder to touch than the wooden spoon!

A metal coin may feel colder to touch than a wooden spoon at the same temperature because of the rate at which heat is conducted away from our body to the metal.

Credits: piqsels.com. URL: https://www.pikrepo.com/ftjzy/person-holding-pile-of-coins. License: CC0.

Here's a hint — if you were in a room at 55° Celsius somewhere in the Sahara desert, you would find the metal coin hotter than the wooden spoon. Human beings do not make very good thermometers. When we touch a coin, heat gets conducted away from our body to the metal (a better conductor) at a faster rate than that to wood (a poorer conductor). It is this loss of heat that we interpret as 'feeling colder'. If you used a thermometer, you would find the coin and spoon to be at the same temperature (see **Box 1**).

Not surprisingly, 86 % of Grade VIII students presented with a similar thought experiment (see **Concept Builder: Which is hotter?**) predicted that a metal spoon that has been in hot water for half a day would be hotter than a wooden or plastic spoon given the exact same treatment (see **Table I**).

Box 1. Check out this interesting video, of a researcher trying this 'trick' out on many different people: https://youtu.be/vqDbMEdLiCs.

How would you explain what is happening here?

We begin to see things in the dark after we've been there for a while

Again, you may be tempted to agree with this statement. So do many middle school students when presented with a similar thought experiment (see **Concept Builder: Can you see in a dark room?**). Why do we believe this to be true?

Do you remember the many instances when you've been unable to see anything in a 'dark' room immediately after entering it? You may also recall that you were able to see at least a few things in the room after your eyes had a few minutes to adjust to the 'darkness'. Right? Many of us rely on these memories to respond to this statement. Would the same thing happen in a room that is completely dark? Few of us have experienced a completely dark room in our day-to-day lives (there is always some light trickling into any room, like from the moon or a street lamp). So we tend to assume that our observations of relatively 'dark' rooms would hold true — we would be able to see things, at least dimly, after our eyes have had some time to adjust to the darkness. We may even believe that this adjustment would take more time than usual. However, in reality, if no light enters the room, we will not be able to see anything, however much time we spend in it. This is because we only see an object when the light it reflects strikes our eyes.

We only see an object when the light it reflects strikes our eyes.

Credits: piqsels.com. URL: https://www.piqsels.com/en/public-domain-photo-zbbol. License: CC0.

A heavier object always falls to the ground faster than a lighter object

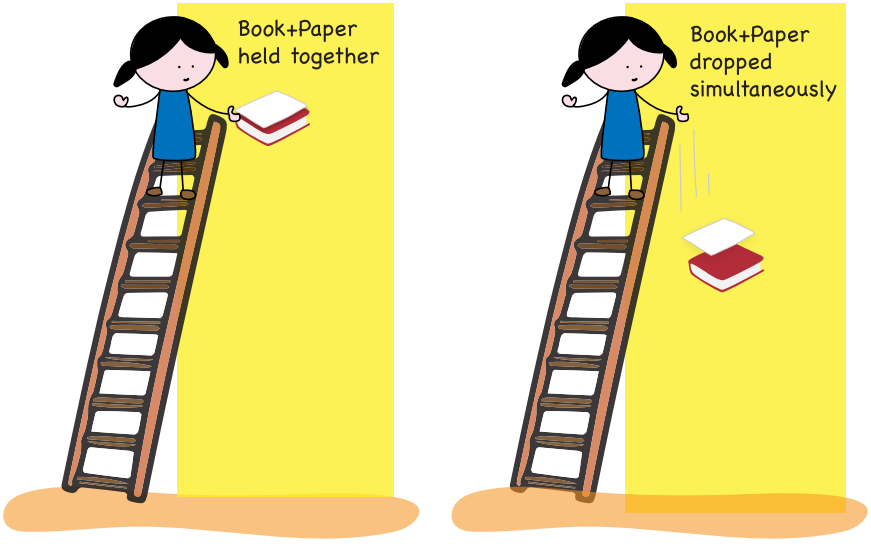
Let's suppose that you were to drop a heavy brick and a small book (taped so that it won't open up), from the 3rd floor of a building, at the same time. Which of these do you think will be likely to hit the ground first? If you find this hard to answer, imagine dropping a book (taped to prevent it from opening up) with a piece of paper placed on it. Do you expect the book and paper to reach the ground together? Or, do you expect the paper to 'stay back'?

We have posed these questions (among many others) to several students, teachers, and intelligent adults over the years. Most are surprised at what they find — heavier objects fall at the same rate as lighter ones. For example, 50% of Grade IX students presented with a similar thought experiment (see Concept Builder: **Do heavier objects fall faster than lighter ones?**) predicted that the heavier ball would fall to the ground faster than the lighter one (see **Table II**).

Which will be hotter after being in hot water for half a day?	Option	Percentage of Grade VIII students who chose this option (%)
The metal spoon	A	86.4
The plastic spoon	B	4.2
The wooden spoon	C	3.9
All three spoons are at the same temperature	D	5.2

Table I. Which is hotter?

Credits: Data based on ASSET, a diagnostic test from Educational Initiatives: http://www.ei-india.com/asset/.



Will the book and paper fall together? Will the paper fall slower?

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Strangely, many of us have learnt the science behind the phenomenon. We have read how the rate at which objects fall to the ground is independent of their mass and, even, solved problems based on equations that show this. Yet, when presented with a real-world example, many of us continue to believe that heavier objects fall faster than lighter objects. Why does this happen?

One possibility is that we may not have grasped the idea of air resistance. As a result, we interpret our observation of the slow drifting fall of a leaf or a feather as evidence for the idea (or 'mental model') that 'lighter objects fall slower' (see **Box 2**).

Even those of us (including older children and adults) who do understand the idea of air resistance may hold on to this inaccurate mental model. Often, this is because we wrongly extrapolate the idea that heavier objects experience a higher gravitational pull to conclude that they would also fall at a faster rate. In fact, it is quite 'intuitive' to think that a heavier object would fall faster than a lighter one; and, not entirely wrong either (see **Box 3**). However, as a limited idea that applies only to special cases, it is certainly not the general scientific principle that we tend to use it as.

Applying to practice

The three examples we have discussed here reveal some common 'mental models' that children, and even adults, use to interpret real-world phenomena (see **Box 4**). Not only do students come to the classroom with scientifically inaccurate models, they may leave it with their understanding unaltered by what they learn. More often than not, neither the teacher nor the learner is aware of these mental models. It may even appear as if students have clearly understood a scientific concept ... till they face a situation of 'cognitive conflict'. A good science teacher recognizes that working through such confusion and conflict is critical for deep learning.

Let us see how this might play out in the case of the falling objects. First, a teacher could create a cognitive conflict by encouraging students to try out the experiment with the 'paper on the book'.

Which of these balls will fall faster to the ground?	Option	Percentage of Grade IX students who chose this option (%)
Q will fall faster than P because heavier objects always fall faster to the ground	A	43.7
P will fall faster than Q because lighter objects always fall faster to the ground	B	7.8
Both will fall at the same rate because the time taken for an object to fall does not depend on its mass	C	41.9
We cannot say because it depends on the height from which the two fall	D	6.6

Table II. Which will fall faster?

Credits: Data based on ASSET, a diagnostic test from Educational Initiatives: http://www.ei-india.com/asset/.

Box 2. Does some small part of you still doubt that a feather would reach the ground at the same time as a heavy bowling ball in the absence of air resistance?

The only way one can be completely sure of this is by dropping these objects in a vacuum environment (an expensive environment to create). Fortunately for us, this experiment has been tried out (watch this amazing clip from BBC's Human Universe series https://youtu.be/E43-CfukEgs), and has proven this particular mental model inaccurate.

Observing the slow drift of a feather can lead to the mistaken assumption that 'lighter objects fall slower'.

Credits: Louise Docker, Wikimedia Commons. URL: https://commons.wikimedia.org/wiki/File:Bird%27s_Feather_in_Flight.jpg. License: CC-BY.

Box 3. In his book 'The unnatural nature of science', the eminent British biologist Lewis Wolpert argues that *"scientific ideas are, with rare exceptions, counter-intuitive: they cannot be acquired by simple inspection of phenomena and are often outside everyday experience"*

Do you think any of the three examples discussed here support this claim? Why?

Box 4. Would you like to discuss these examples in more detail?

Visit our blog posts:

1. Does a heavier object fall faster? URL: https://tostudentandteacher.wordpress.com/2015/01/17/does-a-heavier-object-fall-faster-to-the-ground/
2. Power of demonstration on unlearning. URL: http://blog.ei-india.com/2015/02/power-ofdemonstrations-on-unlearning/

This experiment may alert students to the existence of air resistance, and create sufficient doubt about what had previously seemed self-evident (that heavier objects fall faster). The teacher could guide a group discussion to help students think through the different factors that might have played a role in the outcome of the experiment. Students may identify factors like the windiness in the classroom; or the relative surface area, hollowness, and roughness of the two objects. Having done this, the teacher could encourage students to test these factors by designing and performing a variety of experiments with different objects. These would help progressively clarify student ideas till they arrive at the conclusion that lighter objects do indeed fall at the same rate as heavier objects.

Key takeaways

- Children may enter the classroom with scientifically inaccurate mental models of natural phenomena.
- Unless recognized, these mental models may remain unaltered by the concepts students are introduced to in the science classroom.
- Teaching–learning processes that recognize this possibility attempt to bring such mental models to the surface, so that the learner, as well as the teacher, becomes aware of them.
- Teachers can use a variety of methods, discussion, and supporting exercises to help the learner replace incorrect prior mental models with scientifically accurate ones.

Notes:

1. This is a revised & reformatted version of an article (with the same title: 'Challenging Prior Mental Models') that first appeared under the section 'Myth or Fact' in the November 2015 issue of i wonder.
2. Source for the image used in the background of the article title: https://pixabay.com/photos/mechanical-brain-man-machine-2033446/. Credits: aytuguluturk, Pixabay. License: CC0.

Vishnuteerth Agnihotri has worked for a decade on improving learning and assessment with Educational Initiatives. His current interests lie in developing an integrated multi-disciplinary curriculum. Vishnuteerth can be contacted at vishnu.agnihotri@gmail.com.

Anagh Purandare teaches science and biology at Rishi Valley School. His previous work experience has involved the design of assessment tools to test conceptual understanding of school children. Anagh's current interests lie in integrating different topics to facilitate science learning. He can be reached at anaghrv@gmail.com.

Introduction

A taxonomy is used to classify things. Bloom's is a taxonomy of educational objectives. This taxonomy defines levels of objectives in 3 domains:

- Cognitive (knowledge based)
- Affective (emotive based) &
- Psychomotor (action based)

A revised version of Bloom's taxonomy was published by Anderson et al. in 2001. We will concentrate on cognitive domain from revised Bloom's taxonomy in this document.

Bloom, B. S. (1956). Taxonomy of educational objectives: The classification of educational goals .
Anderson, L. W., Krathwohl, D. R., & Bloom, B. S. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. Allyn & Bacon.

Why Bloom's taxonomy?

Educational activities include setting learning objectives for students, assessing students and delivering instruction. An **alignment** between these activities is necessary: We should ensure that we are assessing the students on required learning objectives. The instruction should be directed towards helping student achieve those learning objectives.

Bloom's taxonomy provides one way to create and classify these educational activities and check for alignment between them. By providing a **hierarchy**, it provides a sense of difficulty/complexity of educational activities. It has been persistently used from 1956 by teachers, policy-makers, learning technology developers around the world.

Cognitive Domain

The levels in cognitive domain are as follows according to revised Bloom's taxonomy:

- Create
- Evaluate
- Analyze
- Apply
- Understand
- Remember

This is a hierarchy and each level subsumes the ones below it.

For each of these levels let us see a brief description of the level, an example of an assessment question at that level, some frequently used action verbs to frame questions at that level and an example of a task at the level using a technology. Let us start from the lowest level in the hierarchy.

Remember

Description: Recognize, recall facts

Example: Recalling Newton's laws of motion

Action verbs: list, recite, define, name, match, quote, recall, identify, label, recognize

Task using a Technology: Highlighting, Bookmarking, Flashcards, Searching/Googling

Understand

Description: Grasp meaning, explain, interpret, translate, paraphrase

Example: Describing the concept of uniform circular motion

Action verbs: describe, explain, paraphrase, restate, give original examples of, summarize, interpret, discuss

Task using a Technology: Summary writing in blog/wiki/journal, Explaining by Mind maps, categorising, annotating

How does this subsume the level below (recall)?

This would require the learner to recall the concept of constant speed and tangential direction. Then explaining what happens when a body in constant speed changes its direction constantly.

Apply

Description: Use knowledge in a new situation. Involves rules, methods, laws, principles

Example: Use the formula of $s = ut + \frac{1}{2} at^2$ to solve a problem

Action verbs: calculate, predict, apply, solve, illustrate, use, demonstrate, determine, model

Task using a Technology: Creating presentations (Powerpoint, Zoho, Prezi), Play simulation/games, explain using screen capture

How does this subsume the level below (understand)?

Assuming that the formula is not given, this would require the learner to recall the formula and its parameters.
Then assigning correct values for the parameters and solving and converting units.

Analyze

Description: Separate whole into parts until structure of whole and relationship between parts is clear.

Example: Analyze a physical scenario and find the relative magnitude of forces acting upon the object in the scenario

Action verbs: classify, outline, break down, categorize, analyze, diagram, illustrate

Task using a Technology: Organizing using (database, MS Excel), analyze & explain graphs(excel, draw.io, graphsketch.com), Mashups

How does this subsume the level below (apply)?

This would require the learner to: Understand what forces are acting
Recall their formulae
Apply those formulae to find the relative magnitude

Evaluate

Description: Judge value based on criteria, decision making.

Example: Evaluate a given free body diagram for a given physical scenario

Action verbs: choose, support, relate, determine, defend, judge, grade, compare, contrast, argue, justify, support, convince, select, evaluate

Task using a Technology: Create argumentation maps (Mind map, compendium), Writing summary (Wiki, blog, journal), Writing review/critique/conclusions (Comments, wikis)

How does this subsume the level below (analyze)?

This would require:
Analyze the physical scenario to find objects and forces present
Remember relevant concepts
Apply the procedure to write free body diagrams
Compare the two free body diagrams

Create

Description: Combine parts to make (new) whole, creative behaviours, propose plans

Example: Create working models to demonstrate Newton's laws of motion

Action verbs: design, formulate, build, invent, create, compose, generate, derive, modify, develop

Task using a Technology: Write a program(IDEs) ,Plan an activity (planners), create models (Blender, Sketchup), create blog, vlog, podcast

How does this subsume the level below (evaluate)?

This would require the learner to: Analyze real world examples of Newton's laws Explain how Newton's laws in the context of those examples Identify objects and forces Calculate relative magnitude/ momentum/ final velocity etc