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Constructivist Lesson Plan

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Lesson planning is an important step in effective teaching. Lesson plan reflects a teacher's philosophy of teaching and learning. The lesson plan guides teachers in selecting and designing learning activities, developing learning materials, organising the class and managing the time. Lesson plan states inputs, interaction during teaching-learning process and expected learning outcomes. Time required, role of teacher, role of students, and plan for assessment of students is also included in the lesson plan. A Lesson Plan has

- theme/topic of the lesson;
- objectives of the lesson;
- time required to complete the lesson;
- planned learning activities/tasks;
- material required;
- engagement of learners with learning tasks (whole class, group work, pair work, individual activity);
- scaffolds (Learning support in the form of resource materials, probing questions, suggestions, etc.);
- discussion on students' work; and
- assessment of learning progress.

Traditional Lesson Plan

A perusal of lesson plans developed by pre-service and in-service teachers suggests that these are influenced by 'behaviourist' view of learning. Objectives are written in terms of Bloom's Taxonomy, such as: 'at the end of lesson, students will recall definition, describe process, etc.' Objectives are followed by a three-column description of content, teacher activity and pupil response. Some lesson plans have a fourth column of evaluation questions. The teacher activity column contains statements such as teacher narrates story, explains concepts, demonstrates filtration process, writes on the black board, draws a diagram, reads a poem. The pupil response is generally stated as pupils listen carefully, observe demonstration, or copy from black board. Evaluation questions are pre-planned and asked at the end of lesson. Teacher also recapitulates what was

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taught during the lesson. The lesson plan is rigid and does not provide flexibility for adaptation to students' responses, learning styles and needs.

Student teachers are expected to deliver lessons as planned. When class is organised using such lesson plans, it becomes a teacher-centred class. Teacher provides the knowledge and students receive this knowledge in a passive manner. Students are expected to memorize the information provided by teacher and reproduce the same in class test/unit test.

Constructivist Perspective

Constructivist teaching considers students as active participants in the learning process. Teacher is a facilitator in the process of learning. Children learn better by actively constructing the knowledge. During the process of knowledge construction, students question other students' ideas and give their own ideas, formulate and test hypothesis, design experiments, interpret and discuss results; students verify and validate their own ideas. Students elaborate and interpret ideas from the text. Students do not acquire knowledge, they construct knowledge. Teacher facilitates the process of learning by providing such learning experiences/situations where students discover, explore and generate their own ideas and provide adequate explanations for observed phenomenon and processes.

In a constructivist classroom, the role of teacher changes from transmitter of knowledge to facilitator of knowledge. The role of student changes from passive receiver of knowledge to active participant in the process of learning. The constructivist lesson plan reflects this shift. In constructivist classroom, lesson develops with the help of student responses. The lesson plan is flexible to allow alternate interpretations and pupil generated explanations. For organizing a learner-centred classroom, the lesson needs to be planned in such a way that students work with materials and activities, generate their own explanations and interpretations.

Following table reflects the change from behaviourist to constructivist paradigm.

Behaviourist	*Constructivist*
• Knowledge is fixed and is objective.	Knowledge is evolving and is subjective.
• Teacher provides information.	Teacher provides learning experiences/situations.
• Students are passive receivers of knowledge	Students are active participants in the learning process.
• Students acquire knowledge.	Students construct knowledge.
• Students memorize facts/ theories, principles.	Students develop their own ideas on the basis of their experiences inside and outside class.

• Students learn individually.	Students learn in groups, discussing, sharing and understanding others view point.
• Assessment is undertaken as a separate activity.	Assessment is integral part of teaching-learning process.

Constructivist Lesson Plan

In constructivist lesson plan, teacher develops lesson into learning tasks. Whole class, group, pair and individual activities are designed to give children opportunities to work with others and also to work on their own. Problems which are relevant to students are selected. Strategies to engage children in meaningful learning activities are planned. Lesson plan develops with the help of students' responses. Students' responses are windows in to their reasoning and help teacher in selecting appropriate scaffolds. Teacher addresses students' curiosity and suppositions; gives situations which question students' beliefs and ideas; assesses students as they progress on the learning tasks. Learning is structured around essential concepts.

Lesson planning requires selecting and designing activities, problems and questions for students, strategies for organisation of whole class, group, pair and individual activity. Assessment, which is part of teaching learning process, is also stated in the plan.

Constructivist Teaching

Teacher uses students existing knowledge to guide teaching. Teacher can make students existing ideas explicit by challenging pupils' ideas or by providing interesting questions or situations. Teacher elicits children's' ideas before presenting her ideas. Teacher guides students to generate ideas, explanations and alternative interpretations. Pupils explain, clarify and justify their responses. Teacher provides a question-rich learning environment. Questions are based on students' responses. Teacher values students' responses and instead of classifying these as 'right' or 'wrong', asks students to reason and justify. Teacher engages children in active learning. Students work with materials and activities. Students work independently with minimal help from the teacher. Students test their ideas and prove or disprove their ideas. What they think students discuss their ideas with peers, contradict each others' ideas and put forward their own ideas. Students relate their learning to real life situations.

Behaviourist vs. Constructivist Lesson Plan (Illustrations)

Illustration I

Behaviourist Lesson Plan

Theme: Electric Circuit

Time: 30 Minutes

Objectives: At the end of lesson, students will,

- Recall that electric cell has a positive (+) and a negative (-) terminal.
- Recall that torch bulb also has a positive (+) and a negative (-) terminal.
- Draw an electric circuit and indicate the direction of current flow.

3. Mark 'True' or 'False' for following statements:
   (a) Electric current can flow through metals.
   (b) Electric current can pass through a sheet of thermo Col metals.

Content	*Teacher Activity*	*Pupil Response*
Electric Cell	Have you seen an Electric Cell? Showing a cell to the students: The metal cap is the positive terminal of the electric cell. The metal disc is the negative terminal. All the electric cells have two terminals; a positive terminal and a negative terminal	Yes Observe
Bulb	You all have seen bulb. This is a torch bulb. Chart shows a torch bulb and it's inside view. The fine wire fixed in the middle of the glass bulb is filament.This base of the bulb and the metal tip of the base are two terminals of the bulb.	Observe
Electric Circuit	Demonstration: Makes an electric circuit and asks students to observe. Draws diagram of electric circuit on black board and asks students to label it.	Students observe teacher making an electric circuit Students try one by one.

- Define a 'closed circuit' and an 'open circuit'.
- Distinguish between a 'closed' and an 'open' circuit.

Evaluation Exercises:

1. Draw diagram of an electric cell and label positive and negative terminal.
2. Draw diagram of electric circuit and show direction of current flow.
4. What is the difference between a 'closed' and 'open' circuit.

Constructivist Lesson Plan

Theme: Electric Circuits
Time: 60 Minutes (2 periods)

Objectives

- Learner explores how a bulb can be lighted using a pencil cell and wires.

- Learner draws on paper a diagram for his/her plans (arrangements) for lightening the bulb.
- Learner provides reasons and adequate explanations for the diagram made (such as why she/ he thinks that this arrangement will light the bulb.
- Lights the bulb using her/ his plan.
- Compares the arrangement that lights the bulb with the diagram.
- Students who succeeded in lighting the bulb and also those who failed to light the bulb share their diagrams on the blackboard.
- Label source of energy, path and appliance in the diagram.
- Define 'open' and 'closed' circuits
- Materials (Class has 32 students, they will work in eight groups of four each): Pencil cells (8), bulbs (8), and wires (32).

Procedure: For understanding students existing ideas, teacher will use familiar situations such as

– Showing a torch to the students, how this torch bulb lights.

Students responses may include torch has a battery; torch bulb is lighted when the button is pressed; button connects electric cell to the bulb.

– How can you make an electric bell on your desk?

Students' responses may include– by connecting battery to bell with wires.

Teacher: Can you light a bulb in similar manner? What materials would be required to light a bulb?

Let students answer what material will they need and how they will make a bell or light a bulb.

Teacher will ask students to explore ways of lighting a bulb using an electric cell and wires.

Learning Task

- Teacher asks students to make groups. Each group will have four students. Students quickly move in to groups.
- Teacher provides package of material containing a battery, wires and a bulb to each group. You have to put these together to make the bulb light.
- Before start putting these things together, draw a diagram of your plan. You can share diagrams and ideas with others in your group.
- Teacher asks students to draw their diagrams on the black board. Teacher asks questions such as:
  - Why did you decide to connect cell and bulb this way?
  - Why do you think, this set up will light the bulb?
  - Can you design another set up that is different and will still work?
- Teacher asks students to put the material together as per their plan and see if this arrangement lights the bulb.
- Some students will be able to light the bulb, others may not.
- Teacher asks students to share their diagrams (both success and

failure) on the blackboard with other students.

- Teacher asks students to explain why their set up worked or did not work?
- Students interact and share their ideas. Through interaction students understand what kind of arrangement is required to light the bulb.
- Teacher introduces the term 'circuit'. Students evolve their own definition of 'circuit' and label
  - Source of energy
  - Pathway
  - Appliance
- Students draw conclusions
  - Closed circuit is complete circuit.
  - Open circuit is incomplete circuit.

Discussion

In behaviourist approach, teacher explains, demonstrates and draws diagram of electric circuit. Teacher tells students about positive and negative terminals of a cell and how to connect these to bulb using wires. Students observe, listen and copy from the blackboard. Teacher defines 'circuit' and, open and closed circuit. Teacher provides information and knowledge and students acquire knowledge.

In constructivist approach, students explore ways to light a bulb. They draw diagrams for different setups that they think can light the bulb. Give reasons for their setup as to why they think this set would light the bulb. Try out their plans; reason out for success or failure of a set up. Arrive at their own conclusion why some setups worked whereas others did not. Students evolve their own definition of 'circuit' and distinguish between 'open' and 'closed' circuit.

Illustration 2

Behaviourist Lesson Plan

Theme : Word problem involving money

Time : 30 Minutes

Class : III

Objectives : At the end of lesson students will

- understand procedures and algorithms to solve word problems;
- apply these procedures and algorithms to solve new problems.

Content	*Teacher Activity*	*Students Activity*
Word problems involving addition of money	In this lesson, you will learn to solve problem involving addition of money. • Let us take up this problem: (Teacher writes problems on the black board). Ramesh buys one note book, one pencil and one eraser.	Students add in their notebooks.

	• The cost of one notebook is ₹ 20, a pencil ₹ 5 and an eraser ₹ 2. What is the total cost of these three items– a notebook, a pencil and an eraser? 20 + 05 + 02 27	
	• Teacher explains whenever 'total amount' is required, use 'addition' operation.	Students listen
	• Now solve this problem: cost of one ball is ₹ 30, cost of one bat is ₹ 100, what is the total cost of ball and bat? 100 +30 130	Students apply addition in their notebooks
Word problems involving multiplication of money	Cost of one notebook is ₹ 20. What is the cost of five note books? 20 × 5 100	Students copy in their note books.
	Teacher explains, apply 'multiplication operation', when the word each appears in the problem. Now, solve this problem: What is the cost of 10 balls, if each ball costs ₹ 30? 30 ×10 00 30× 300 What is the cost of 20 balls, if each ball costs ₹ 30? 30 ×20 00 60× 600	Students copy in their note books.

Constructivist Lesson Plan

Theme : Word problems involving money

Class : III/IV

Time required : 60 minutes (Two periods)

Objectives: Students will work on the following learning tasks:

1. Discuss daily life situations, where money transaction is involved, with peers and teacher.
2. Identify word problems, from daily life situations, involving money.
3. Discuss with peers and teacher how to solve word problems involving money.
4. Solve word problems involving money (whole class). The problems focus on addition, subtraction, multiplication and division involving money.
5. Solve problems in groups.
6. Make up their own word problems (pairs work).
7. Solve these own made word problems (pairs work).

Materials

Toy currency of ₹ 1, ₹10, and ₹ 100, chalk, black board, duster.

Procedure

1. Teacher will ask students to think about daily life situations where they use money or observe their parents using money. Teacher will ask questions of the kind.
   - How much money is needed to buy a ball?
   - How much money is needed to buy a school bag?
2. To make students existing knowledge explicit, teacher will ask students to role play as buyer (student) and seller (shopkeeper) or a 'canteen' play will be arranged, where students buy things using toy money.
3. Teacher will ask questions when they buy things or sell things.
   - How much is the cost of ball?
   - How much money have you paid?
   - How much is the balance money, that you need back?

Teacher will move from one group to another observing students in role play and asking them why and how of what they are doing?

4. Teacher will explain to the students that they use mathematics every time they figure out how much money they spend, save or need.
5. Students solve word problems as a class. Teacher writes following problems on the Black Board.

(i) You want to buy a notebook, a ruler, a pencil and an eraser for mathematics class. The cost of the notebook is ₹ 20, the ruler ₹ 10, pencil ₹ 5 and eraser ₹ 2. What is the total amount of money, you need to buy these items?

Ask students, which mathematical operation they should use.

Notebook	-	20
Ruler	-	10
Pencil	-	05
Eraser	-	02
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Teacher observes how students solve the problem. You need ₹ 37 to buy a notebook, a ruler, a pencil and an eraser.

(ii) How much money you need to buy three pencils and two erasers?

Which mathematical operations should you use here? Students' responses may be of the kind,

$5 \times 3 = 15$

$2 \times 2 = 4$

$$\begin{array}{r} 15 \\ +4 \\ \hline 19 \end{array}$$

(iii) Ramesh takes a rickshaw to come to school. Rickshaw puller charges ₹ 15 for that. Ramesh pays same amount, ₹ 15 for going back to home, from school. How much money he spends on travel, for coming to school and going back home each day. Students may solve this problem in different ways.

$5 \times 2 = 30$

$$\begin{array}{r} 15 \\ +15 \\ \hline 30 \end{array}$$

(iv) Rita gets ₹ 5 as pocket money on each day she attends the school. How much pocket money will she get in 6 days? Teacher asks students to make table, so that students relate table to addition and multiplication operations.

Days	*Pocket Money*	
1	5	$5 \times 1 = 5$
2	5+5(10)	$5 \times 2 = 10$
3	5+5+5(15)	$5 \times 3 = 15$
4	5+5+5+5(20)	$5 \times 4 = 20$
5	5+5+5+5+5(25)	$5 \times 5 = 25$
6	5+5+5+5+5+5(30)	$5 \times 6 = 30$

(v) Abdul works as a daily wager and gets ₹ 50 per day. How much money will he get for 5 days work? Represent in the form of table:

No. of days	*Pocket Money*	
1	50	$50 \times 1 = 50$
2	50+50(100)	$50 \times 2 = 100$
3	50+50+50(150)	$50 \times 3 = 150$
4	50+50+50+50(200)	$50 \times 4 = 200$
5	50+50+50+50+50 (250)	$50 \times 5 = 250$

Teacher asks students to work in groups and pairs. Teacher selects problems for group work and pair work.

Group Work: For Group Work, different groups can work on different problems. The groups then present their problems and solutions. This way, whole class learns to solve as many problems as the number of groups.

Group I: If a person who runs a tea stall earns ₹ 30 in a day, how much will he earn in 10 days?

And in a month?

How did you get the answer? Discuss.

Group II: Hariya has taken a loan of ₹ 300 from a bank for six months. He will pay ₹ 51 every month to bank.

But Babu has taken a loan of ₹ 300 from Chunnilal. After six months, he will pay back ₹ 360.

Who has to pay back more Hariya or Babu?

Group III: 1 kg newspaper costs ₹ 5. What is the cost of 31 kg newspaper?

(Examples of group work taken from NCERT textbooks).

Pair Work: Students make up work problems while working in pairs and also find solutions to their problems.

Some examples of problems made up by students:

1. I buy one litre milk every day. The cost of one litre milk is ₹ 28. How much will be my bill for one month (30 days)?

   Solutions Proposed:

   - *One day* - One litre milk
   - *30 days* - 30 litres milk

   Cost of 1 litre milk = ₹ 28

   Cost of 30 litres milk = ₹ 30 × 28

$$\begin{array}{r} 28 \\ \times 30 \\ \hline 00 \\ 84\times \\ \hline 840 \end{array} \quad \text{or} \quad \begin{array}{r} 30 \\ \times 28 \\ \hline 240 \\ 60\times \\ \hline 840 \end{array}$$

Each day, I pay ₹ 28 for 1 litre milk. In 30 days, I will pay ₹ 28 × 30

$$\begin{array}{r} 30 \\ \times 28 \\ \hline 840 \end{array}$$

2. Cost of my newspapers is ₹ 5 on all days of the week except Sunday. On Sunday, newspaper coasts ₹ 7. How much will be my bill for one month (30 days).

Solutions Proposed:

- Cost of newspapers on all days except Sunday =₹ 5.

  (Suppose there are four Sundays).
- Cost of newspapers on 26 days will be, ₹ 5 × 26
- Cost of newspapers on one Sunday is ₹ 7.
- Cost of newspaper on four Sundays will be, 7×4

$$\begin{array}{r} 26 \\ \times 5 \\ \hline 130 \end{array} \qquad \begin{array}{r} 7 \\ \times 4 \\ \hline 28 \end{array} \qquad \begin{array}{r} 130 \\ +28 \\ \hline 158 \end{array}$$

Alternate solution

- Cost of newspaper on Sunday = 5+2
- Cost of newspaper for 30 days, considering ₹ 5 as cost each day = $\begin{array}{r} 30 \\ \times 5 \\ \hline 150 \end{array}$
- On Sundays, it costs ₹ 2 more

- On 4 days, I will pay Rs. 4×2= Rs. 8 more

  Bill amount = 150
  + 8
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Discussion: In behaviourist approach, teacher explains the procedure and algorithms, solves problems on the black board and explains solution. Students learn procedures and algorithms.

In constructivist approach, students evolve their own strategies to solve the problem. Through discussions, students arrive at negotiated solutions. Alternate ways to solve the problems are encouraged. This way students themselves find relationship between addition, multiplication and tables. In constructivist approach, students work in groups, collaborative learning is encouraged. Students learn from each other. In behaviourist approach, students work individually.

Conclusion

Behaviourist lesson plan is in terms of 'teacher activities', that is, what teacher will do during teaching session. Objectives are defined in terms of 'behavioural change'. At the end of lesson, students well recall definitions, describe processes, draw and label diagrams and solve problems using learnt procedures and rules. Students are treated as passive receivers of knowledge. Students learn individually. Constructivist lesson plan is in terms of learner activities, that is, what students will do during the teaching learning session. How teacher will engage them in learning activities? Teacher plans, and designs activities for students. Collaborative learning and peer interaction is encouraged. Students' progress on learning tasks is assessed and teacher uses feedback to decide scaffolds. Lesson develops on pupil responses. Students are constructors of knowledge and teacher is facilitator of knowledge. Constructivist lesson plan is flexible. Unit planning is allowed in constructivist paradigm. Constructivist approach suggests teaching less and learning more. Lesson plan is developed with essential concepts.