

TEACHER SURVEY OF INSTRUCTIONAL PRACTICES (ENDLINE)

Impact Evaluation of Science Education Initiative's Fellowship Program

Abdul Latif Jameel Poverty Action Lab (J-PAL) South Asia

Dear teacher—

You were selected to participate in a study of the Science Education Initiative's (SEI) Fellowship Program, which has been approved by the *Pune Shikshan Mandal* (PMC) and is being conducted by the Abdul Latif Jameel Poverty Action Lab (J-PAL) South Asia, an independent research organization. The study is led by Professors Alejandro Ganimian (New York University) and Isaac Mbiti (University of Virginia).

You can decide whether to participate in this study. If you choose to participate, you may subsequently withdraw from it or ask me to leave at any time without penalty or consequences of any kind. Your decision to participate will not affect your relationship with the PMC, SEI, or J-PAL South Asia. In fact, we do not anticipate any risks from your participation in this study.

If you agree to participate, we would like to ask you some questions about your instructional practices, how you respond to student errors, and how you approach student problems in math and science. The survey will take 45-60 minutes to complete.

There are no known risks associated with your participation in this research.

Please, note that your responses to this survey **will be kept confidential and they will not be shared with the PMC or SEI**. We will only **report the average responses** of all study participants.

If you have any questions or concerns about the research or wish to report a research-related problem, please contact Rashmi Menon at J-PAL South Asia on +91 9873172782. J-PAL's offices are located at AADI, 2 Balbir Saxena Marg, Hauz Khas, New Delhi.

Your name

Date

Your signature

I. GENERAL INFORMATION

1. Teacher name: _____
2. School ID: _____
3. Grade taught:
 - a. Grade 5
 - b. Grade 6
4. Section:
 - a. Section A
 - b. Section B
5. Date: ____ / 04 / 2018
6. Surveyor ID: _____

II. INSTRUCTIONAL PRACTICES

[Please, answer the following questions by selecting only one answer.]

7. Mr. Shetty has just started teaching his students exponents. At the end of the class, he wants to give his students a small sum to check whether they have understood simple exponents.

Of the following problems, which do you think would be the least useful in checking whether students have understood simple exponents?

- a. 3^3
 - b. 2^3
 - c. 2^2
 - d. All of these are equally useful
8. Ms. Das is concerned that, as a result of using the calculator, her students think that the “equal to (=)” sign is a signal to carry out an operation, rather than as a symbol indicating equality.
- Of the following missing-number problems, which do you feel would best help Ms. Das check whether her students understand the mathematically correct meaning of the “equal to” sign?
- a. $__ + __ = 18$
 - b. $7 + 5 = __ + 6$
 - c. $__ = 17 + 9 + 5$
 - d. $24 + 4 = __ = 4 + 23$

9. Mr. Kapoor is teaching his students how to find the side length of a square given its area. At the start of the lesson, he gave them the following problem to check how much they already know.

What is the side length of a square with area 36 cm^2 ?

Several students incorrectly answered that the side length of a square with area 36 cm^2 is 9 units.

At the end of the lesson, Mr. Kapoor wanted to give a similar problem to check how much his students had understood.

Of the following areas to use in this problem, which do you think would be the least useful for Mr. Kapoor to check his students' learning in this situation?

- 9 square units
 - 16 square units
 - 64 square units
 - 100 square units
10. Mr. Kunal wants to explain to his students that most migratory birds gather in one area and then migrate in large groups rather than individually. Which of the following explanations do you think he should give his students?
- Birds that migrated individually or in small groups were less likely to survive and have offspring
 - Birds that migrated individually or in small groups were more likely to find adequate food
 - Flying in large groups allowed other bird species to join the migration
 - Flying in large groups allowed each bird to have a better chance of finding a nesting site
11. Ms. Patel wants to explain to her students why, as a meteor approaches the Earth and its atmosphere, it speeds up. Which of the following explanations do you think she should give her students?
- The meteoroid is pulled by the rotation of the Earth
 - The meteoroid is pushed by the light of the Sun
 - The meteoroid is attracted to the mass of the Earth
 - The meteoroid is repelled by the vacuum of space
12. Mr. Jadhav's class has a potted plant in their classroom. He wants to conduct an experiment that shows that water travels through the plant into the air. Which of the following designs do you think would best test this hypothesis?
- Pouring water in a container under the plant and observing that the water will eventually disappear from the container
 - Covering one of the stems and leaves of the plant with a plastic bag, watering the plant, and observing how water drops appear in the plastic bag
 - Placing a cut stem from the plant in a plastic bag and observing how the water drops appear in the plastic bag

- d. Placing a cut stem from the plant in a bag of colored water and observing how the leaves on the stem change color

8. STUDENT ERRORS

[Please, answer the following questions by selecting only one answer.]

13. Mr. Shah saw the following mistake when correcting the homework of one of his students.

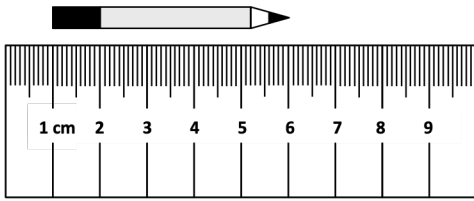
$$\begin{array}{r} 1 \ 9 \\ + \ 8 \ 7 \\ \hline 9 \ 16 \end{array}$$

Which of the following concepts do you think is most likely to be misunderstood by this child?

- Adding single-digit numbers
- Adding double-digit numbers
- Borrowing from one column in the addition to the next
- Carrying over from one column in the addition to the next

14. Ms. Joshi gave her students the following problem:

The length of the pencil is
_____.



A. 4 cm
B. 5 cm
C. 6 cm
D. 7 cm

Many of her students chose option C. Which of the following do you think is most likely misunderstood by these students?

- The use of centimeters to measure objects
- The meaning of the term “length”
- The fact that the space between the start of the ruler and the 1 cm mark is equal to 1 centimeter
- How to count centimeters between any two numbers in a ruler if one of these numbers is not 0

15. In a test, many students added 0.91 and 0.7 and answered 0.98. Which of the following questions do you think these same students will be most likely to answer incorrectly?
- What is $0.27 - 0.12$?
 - What is $0.5 + 0.2$?
 - Which is greater, 0.81 or 0.807?
 - Which number would come next in the pattern? 0.28, 0.3, 0.32, _____
16. A student could identify only one right angle in the following set of angles.



What do you think can be said about that student?

- There is only one right angle, so the student is correct.
 - She can identify a right angle only if it is presented in the standard form.
 - She can identify a right angle only if the length of both line segments is the same.
 - She can identify a right angle only if it is marked with an inverted L-shape.
17. Mr. Menon gave his students the following problem:

This table shows the temperature and precipitation (rain or snow) in four different towns on the same day:

	Town A	Town B	Town C	Town D
Lowest temperature	13°C	-9°C	22°C	-12°C
Highest temperature	25°C	-1°C	30°C	-4°C
Precipitation (rain or snow)	0 cm	5 cm	2.5 cm	0 cm

Where did it snow?

- Town A
- Town B
- Town C
- Town D

Many students chose option D. Which of the following do you think is most likely misunderstood by these students?

- The meaning of the term “precipitation”
- The fact that water freezes below 0 degrees celsius

- c. How change in temperature during the day affects the probability of snow
- d. The fact that precipitation must be non-zero if it snows

18. Ms. Bharati gave her students the following problem:

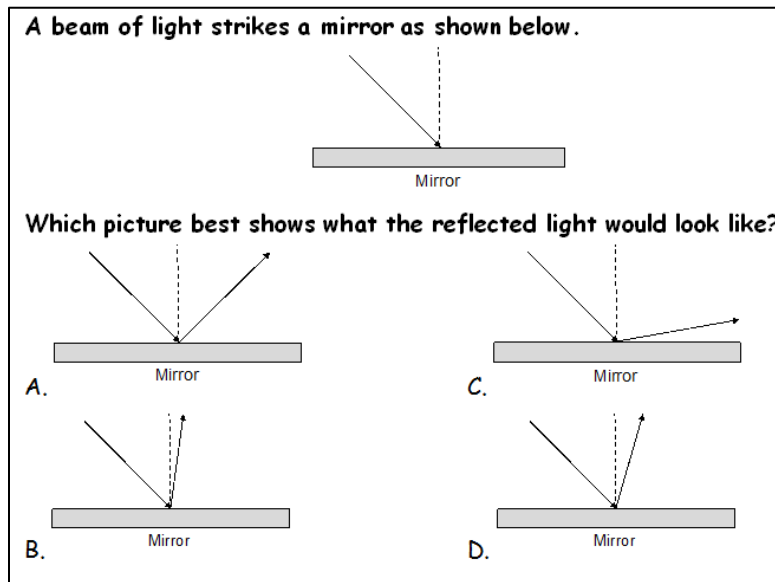
Your temperature is taken when you are NOT sick. Which temperature is CLOSEST to what the thermometer would show?

- A. 29°C**
- B. 37°C**
- C. 100°C**
- D. 212°C**

Many students chose option C. Which of the following is most likely misunderstood by these students?

- a. The use of degrees to measure temperature
- b. The resting temperature of the body
- c. The interaction between body and environmental temperature
- d. How illnesses affect body temperature

19. Mr. Bhatt gave his students the following problem:



Many students chose option B. Which of the following is most likely misunderstood by these students?

- a. How to draw a right angle
- b. The meaning of the phrase “beam of light”
- c. How a mirror reflects images

d. The law of reflection

20. Ms. Krishnan gave her students the following problem:

A powder made up of both white specks and black specks is likely to be:

- A.** A solution
- B.** A pure compound
- C.** A mixture
- D.** An element

Many students chose option B. Which of the following is most likely misunderstood by these students?

- a. The meaning of the term “compound”
- b. The fact that a solution is always liquid
- c. The fact that a compound would not be pure if it combined black and white specks
- d. The meaning of the term “mixture”

CONTENT KNOWLEDGE

[The following questions were part of an assessment of math and science that students in grades 5 and 6 have completed at your school. We have highlighted the answer most frequently provided by students. Please, correct students' responses, crossing out incorrect answers (whenever necessary) and circling correct answers.]

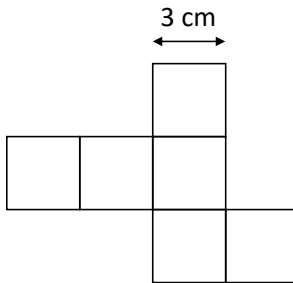
21. See the pattern of numbers in the chart below:

	Column 1	Column 2	Column 3	Column 4	Column 5
Row 1	4	8	12	16	20
Row 2	24	28	32	36	40
Row 3	44	48	52	56	60
Row 4	64	68	72	76	80
Row 5					

Which of these is the correct way of finding the number that will appear just below 64 in column 1?

- A. Adding 1 to 64
- B. Adding 4 to 64
- C. Adding 20 to 64
- D. Adding 44 to 64

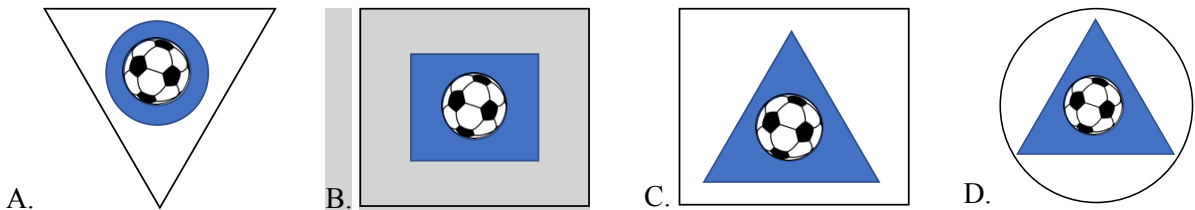
22. The following figure shows a cardboard box unfolded.



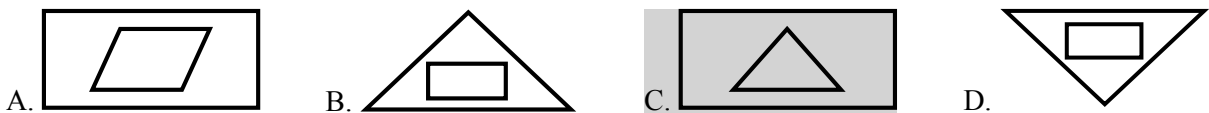
What is the surface area of this box?

- a. 18 cm^2
- b. 27 cm^2
- c. 42 cm^2
- d. 54 cm^2

23. Rama drew a badge for his football club. The badge is formed by a white figure with 4 sides and a grey figure with three corners, with a ball in the middle. Which of the following is the badge drawn by Rama?



24. Which of the following shapes has a rectangle with a triangle inside it?



25. This chart shows temperature readings made at different times on four days.

Temperatures					
	6 a.m.	9 a.m.	Noon	3 p.m.	8 p.m.
Monday	15°	17°	20°	21°	19°
Tuesday	15°	15°	15°	15°	9°
Wednesday	8°	10°	14°	14°	15°
Thursday	8°	11°	14°	14°	20°

When was the highest temperature recorded?

- a. Noon on Monday
- b. 3 p.m. on Monday
- c. Noon on Tuesday
- d. 3 p.m. on Wednesday

26. Three boys went to a market. They spent 5 Rupees each. How much did the three boys spend in total?

- a. 5
- b. 10
- c. 20
- d. 15

27. $112 + 45 + 467 =$ _____

- a. 157
- b. 512
- c. 579
- d. 624

28. What is the total bill amount?

Kamal Stationery 24, Ghandi Road, Ahmedabad			
Goods	Price	Qty.	Amount
Rubber	2.00	5	10.00
Ruler	1.50	1	1.50
Pencil	3.00	1	3.00
Chalk box	15.00	1	15.00
Total Rs.			?
For, Kamal Stationery			

- a. Rs. 10.00
- b. Rs. 21.50
- c. Rs. 29.00
- d. Rs. 29.50

29. Three objects are the same shape and size. One is made of wood, one is made of iron, and one is made of thermocol. Which statement about the weights of these objects is most likely to be correct?

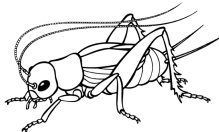
- a. The wood object is the heaviest
- b. The iron object is the heaviest
- c. The thermocol object is the heaviest
- d. All three objects weight the same

30. When this caterpillar

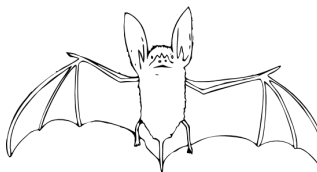


becomes an adult, what will it look like?

A.



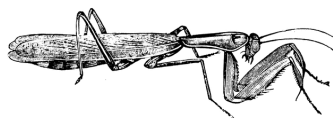
C.



B.



D.



31. The properties of three materials are compared in the table below. One of the materials is wood, one is rock, and one is iron.

Property	Material 1	Material 2	Material 3
Sinks in water?	Yes	No	Yes
Burns easily?	No	Yes	No
Attracted by a magnet?	Yes	No	No

Which is Material 1?

- a. Wood
- b. Rock**
- c. Iron
- d. It is not possible to say with the information provided

32. Which of the objects listed in the table has the greatest density?

Object	Mass of the object	Volume of the object
A	11.0 grams	24 cm ³
B	11.0 grams	12 cm ³
C	5.5 grams	4 cm ³
D	5.5 grams	11 cm ³

- a. A**
- b. B
- c. C
- d. D

33. How can washing your hands help keep you from getting sick?
- a. It washes away your germs
 - b. It makes your hands look nice
 - c. It keeps your skin from drying out
 - d. It makes your hands warmer
34. Pranav sees a full moon. About how much time will go by before the next full moon?
- a. One week
 - b. Two weeks
 - c. One month
 - d. One year
35. A renewable energy source is a source that will not run out. Which is an example of the use of such a source?
- a. A coal furnace heating a house
 - b. A windmill pumping water on a farm
 - c. A kerosene lamp lighting a room
 - d. A diesel truck traveling along a road
36. Some people have straight hair and some have curly hair. What decides whether a person will be born with curly hair or straight hair?
- a. The type of hair their parents have
 - b. The type of hair their brothers and sisters have
 - c. Their hair color
 - d. Their skin color