

SA PLAY GUIDE

EXPECTED RESPONSES:

Item one.

The students can make a periscope it can help them to see over obstacles.

Materials needed ✓ (any one material listed)

- Two small mirrors ✓
- A long hard material like a Card board ✓
- Tape measure ✓ cell tape
- Scissors ✓

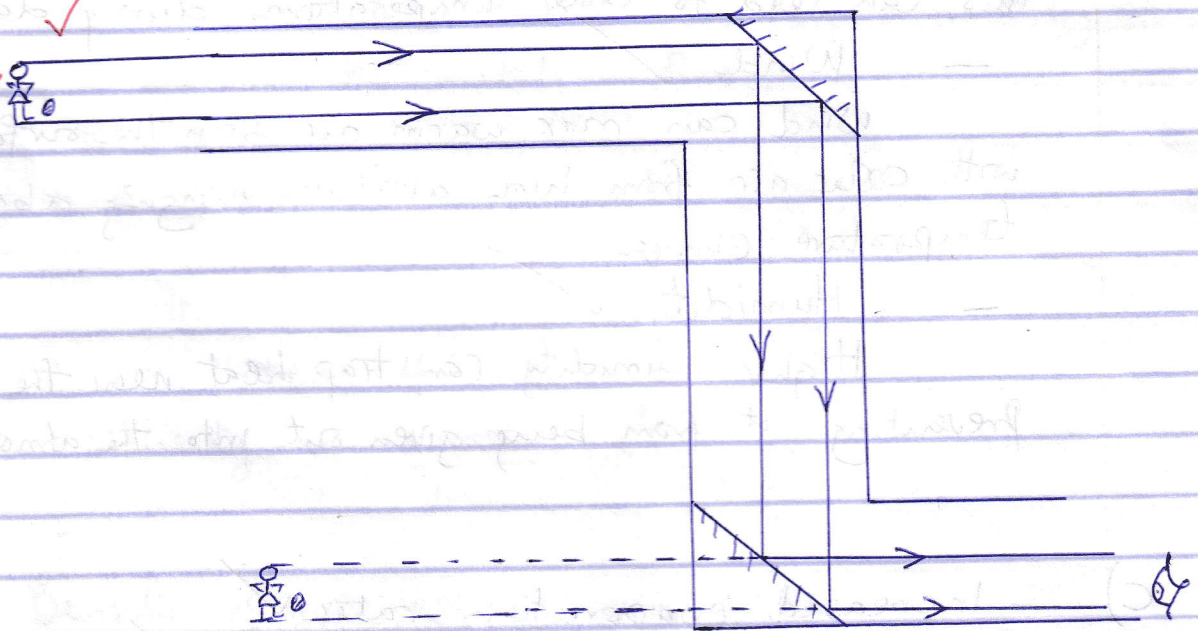
Procedure

- Cut the Card board and fold in L shape ✓
- Attach one piece of mirror at angle of 45° facing downwards and another piece facing upwards at the same angle. ✓

Use.

- Hold one End of the periscope close to your eye ✓
- Looking through the tube, you should be able to see what is on the pitch. ✓

How it works.



Light from the footballer is reflected off the mirror on top to the mirror at the bottom ✓ which gives the image to the observer. ✓

Identification with reason (IR)

Key points = 12

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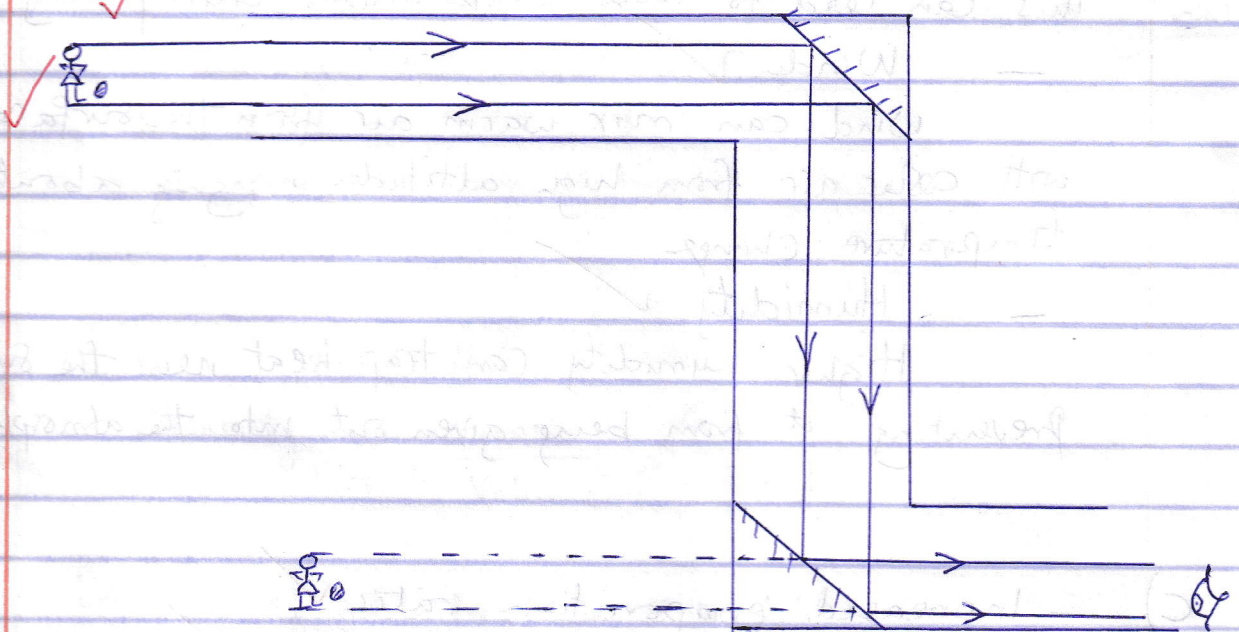
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Identification with reason (IR)

Key points = 12

range of written key points	score
8-12	3
4-7	2
1-3	1
0	0

Item 2:

fundamental interval $y = 30\text{cm}$

a) at mid-day $x = 100\text{cm}$

The temperature $\theta = \frac{x}{y} \times 100^\circ\text{C}$ ✓

$$= \frac{10}{30} \times 100^\circ\text{C} \quad \checkmark$$

$$= 33.3^\circ\text{C} \quad \checkmark \checkmark$$

b) - Solar radiation ✓

During the day, the earth's surface absorbs solar radiation. This makes the earth's temperature to keep increasing until late in the afternoon and after that the temperature starts to cool down as the earth loses heat to the atmosphere.

- Cloud cover. ✓

Clouds can block or reflect sunlight reducing the amount of solar radiation reaching the earth's surface. This can lead to cooler temperatures during day.

- Wind ✓

Wind can mix warm air from the surface with cooler air from high altitudes bringing about temperature change.

- Humidity ✓

Higher humidity can trap heat near the surface preventing it from being given out into the atmosphere.

c) - Increased evaporation rates ✓

- Increased frequency of wildfires ✓

- Increased demand for water irrigation ✓

- Changes in crop yields ✓

- damage of infrastructure like roads ✓

Key points for IR = 9

(MC) Mathematical Computation

Key points = 4

Range key written by learner

Score

Range of key points

Score

a) at Mid-day $x = 100m$

The temperature $\theta = \frac{x}{y} \times 100^\circ C$ ✓

$= \frac{10}{30} \times 100^\circ C$ ✓

$= 33.3^\circ C$ ✓✓

b) - Solar radiation ✓

During the day, the earth's surface absorbs solar radiation. This makes the earth's temperature to keep increasing until late in the afternoon and after that the temperature starts to cool down as the earth loses heat to the atmosphere.

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- Changes in crop yields ✓

- damage of infrastructure like roads ✓

Key points for IR = 9

Range	Key written by learner	Score
5-8	6-9	3
4-5	3-5	2
3-4	1-2	1
2-3	0	0

(MC) Mathematical computation

Range of key points	Score
4-5	2
3-4	1
2-3	0

Item 3
a) They would receive heat through radiation.
Heat energy produced by the burning firewood travels through the space and reaches the people seated hence making them warm.

b) When the one end of the metal is placed in the heat source, the temperature of the molecules at this end increases and they begin to vibrate with more energy. These molecules start to knock the neighbouring molecules transferring heat energy to them. The process continues until heat is transferred to the molecules at the end of the metal he is holding in his hand.

This end also becomes hot hence getting burnt.

This could have been avoided by holding the metal with bad conductors of heat like wood, rubber or cotton cloth.

It could have also been avoided by not placing the metal in fire.

Key points for IR = 10

Range of key points written by learner

Score

7-10

3

3-6

2

1-2

1

0

Item 4:

$$\text{Density} = \frac{\text{mass}}{\text{Volume}}$$

$$\text{Density of avocado} = \frac{500}{200}$$

$$= 2.5 \text{ g cm}^{-3}$$

$$\text{Density of a ball} = \frac{5}{300}$$

$$= 0.02 \text{ g cm}^{-3}$$

The oil sinks in water because its density 2.5 g cm^{-3} is greater than the density of water 1 g cm^{-3}

The ball floats on water surface because its density 0.02 g cm^{-3} is smaller than the density of water 1 g cm^{-3} .

KP for MC = 09
5-9

Score
5-9 2
1-4 1
0 0

Item five:

a) The Kerosene raising through the piece of cloth because the adhesion forces between the piece of cloth and Kerosene is greater than the cohesion forces between the Kerosene molecules ~~thus~~ this makes the wet part of the cloth to keep on increasing upwards. Therefore when the top part of the cloth is lit it will begin burning since it contains Kerosene.

- b)
- Raising of water and mineral salts from the roots to other parts of plants
 - Absorption of water by towel through its pores during wringing of clothes
 - Raising of water up the building through the pores of its structure making the building damp

KP IR = 06

Score
4-6 3
3 2
1-2 1
0 0

Item 6

a) Pushing the box on the ground there is a force resisting the push that acts in the opposite direction. The force / push provided by the five students is equivalent to this opposing force therefore the box remains at rest.

The sixth student increases the pushing force and makes it exceed the opposing force therefore the box moves forward with the net force.

b) The learners instead ~~of~~ pushing, they could have tried pulling the box from the opposite side. This could have helped to increase the forward force.

$$KP \quad IR = 04$$

$$3-4 \quad 3$$

$$X \neq 2 \quad 2$$

$$1 \quad 1$$