

## SPRINGBOARD 6 LESSON 16 MEASURES 2

### TOTAL TIME

**30**  
MINUTES

#### Objective:

- Record estimates and readings from scales used to measure length, mass and capacity

#### Vocabulary:

- interval
- scale
- greater than (>); less than (<)

#### By the end of the lesson children should be able to:

- read scales and identify on the scale the interval that contains a given value.

#### Resources:

- OHT 16.1
- OHT 16.2
- OHT 16.3
- metre ruler
- length of string approximately 32 cm long

### ORAL AND MENTAL STARTER

**10**  
MINUTES

Show OHT 16.1. Explain that each line represents a scale from 0 to 100. Cover up all but the first scale. Establish that the middle division represents 50 and write in the 50. Ask a child to locate 23 on the scale.

#### Q: What interval on the scale does 23 lie within?

Establish that 23 lies between 0 and 50 and is closer to 0 than to 50.

Show the second line. Establish that it is marked in intervals of 25.

Ask a child to locate 70.

#### Q: What interval on the scale does 70 lie within?

Establish that 70 lies between 50 and 75 and is closer to 75.

Repeat using the other lines. Emphasise that the more refined the scale, the smaller the interval.

Explain that we are going to estimate the length of a piece of string and that we want to find an interval that contains the length of the string.

Hold up the piece of string, then hold up a metre rule and discuss the units on the metre rule.

Start by saying that this piece of string is more than 10 cm but less than 100 cm and write on the board:

$10 \text{ cm} < \text{string} < 100 \text{ cm}$ .

**Q: How long do you think this piece of string is?**

Agree an estimate, e.g. 40 cm, and get children to locate this estimate on each of the scales on OHT 16.1.

For each scale identify an interval which contains the estimate. Record as:

$0 \text{ cm} < \text{string} < 50 \text{ cm}$ , etc.

Ask a child to measure the exact length of the string.

Mark this length on each of the scales on OHT 16.1.

**Q: On which scales are our estimate and our measurement in the same interval?**

Discuss the scales in which the estimate and the exact answer are in the same interval and determine which of the statements made earlier about the string are true.

**Q: On which scales are the estimate and our measurement in different intervals?**

Determine which of the statements made earlier about the string are not true.

**MAIN TEACHING ACTIVITY**



Show OHT 16.2. Say that this represents a weighing scale. Point to the 0 and write '140 kg' in the box.

Superimpose the pointer on the face of the scale pointing at zero. Explain that the pointer starts at 0 and rotates clockwise.

Rotate the pointer to the first interval.

**Q: Does this represent 30 kg?**

Take responses. Move round the scale, counting up in 30s at each interval, until the interval with the box is reached. Establish that 30 kg is incorrect as the pointer should be at 210 kg and we are pointing at 140 kg.

**Q: What does each interval represent?**

Establish that each interval represents 20 kg.

Rotate the pointer to different positions on the scale, such as 86 kg, and ask the children to give an estimate of the weight by first stating the interval that contains the weight.

**Q: What weight is represented when the pointer moves all the way round back to 0 kg?**

Establish that this is 160 kg.

Change the scale. Write 35 kg, 105 kg or 700 g in the box and repeat the above.

**PLENARY**

Show OHT 16.3.

Explain that this cylinder measures the amount of liquid or capacity. Say that each interval represents 5 cl.

**Q: What is the most liquid we can measure?**

Establish by counting up in 5 cl steps that 45 cl is the most we can measure in one go.

**Q: How would you measure 1 litre of liquid using this cylinder?**

Establish that 1 litre is 100 cl and that one possible way would be to measure 45 cl, 45 cl and 10 cl. Discuss alternatives.

Draw a line on the scale to represent 27 cl of liquid.

**Q: How much liquid is in the cylinder?**

Establish that the amount of liquid is greater than 25 cl and less than 30 cl.

**Q: Which would be a better estimate, 25 cl or 30 cl?**

Establish that 27 cl is nearer to 25 cl. Repeat using other estimates.

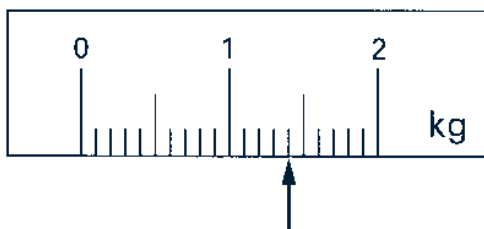
**Remember:**

- When reading a scale, decide what each interval is worth so that you can label the divisions on the scale.
- When estimating, decide which interval contains the measurement and then which side of the interval the measurement is nearer to.
- The larger the intervals on the scale the less accurately we are able to measure.

**LESSON 16 RELATED TEST QUESTION**  
**2001 TEST B (CALCULATOR PAPER)**

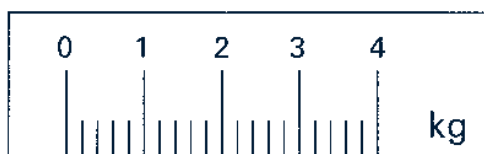
17

On this scale, the arrow (↑) shows the weight of this pineapple.



Here is a **different** scale.

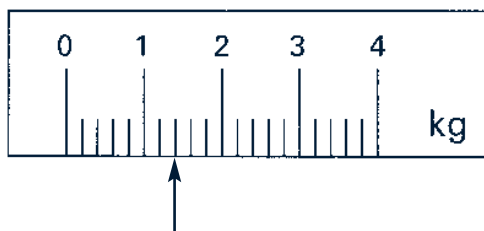
Mark with an arrow (↑) the weight of the **same** pineapple.



1 mark

**GUIDANCE FROM MARK SCHEME**

Question	Requirement	Additional Guidance
17	Arrow marked on scale as shown:	<p>Accept slight inaccuracies, provided the intention is clear.</p> <p>Accept alternative unambiguous indications, e.g. cross on scale.</p> <p><b>DO NOT</b> accept the number '1.4' alone.</p>



**ANALYSIS OF CHILDREN'S ANSWERS**

- Most children attempted the question. The most common error for children working at levels 3 and 4 was to copy the arrow directly below the given arrow, taking no account of the differences in the scales.
- Children who answered the question incorrectly had not read the information provided and had misinterpreted the use of the words 'different' and 'same' in the question.

**IMPLICATIONS FOR PLANNING**

- When starting activities that involve reading scales, children should be taught how to identify the values of the divisions on the scales, and to annotate the scales to help them read and transfer values. Children need to understand that even when the gaps on the two scales are the same size, the value these intervals represent may be different.