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THE UNIVERSITY OF NEW SOUTH WALES

**EDUCATIONAL ASSESSMENT
AUSTRALIA**

ICAS MATHEMATICS

PRIMARY SAMPLE QUESTIONS

PAULA DONKIN, NICK CONNOLLY

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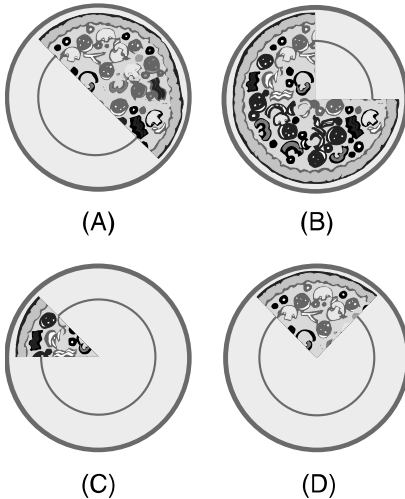
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ICAS Mathematics Primary Sample Questions

This paper is a set of teachers' notes to accompany the ICAS Mathematics Primary Poster. The notes include the full text of each question, the correct answers and notes on how to answer the questions. Some of the text was previously published to accompany the 2005 ICAS Poster.

1. Jack and Mario ate three quarters of a pizza.

Which of these shows how much of the pizza was left over?



Worked Answer

Answer (D).

If Jack and Mario ate three quarters of a pizza then they will have one quarter of a pizza left over. The picture which shows a plate containing one quarter of a pizza is (D).

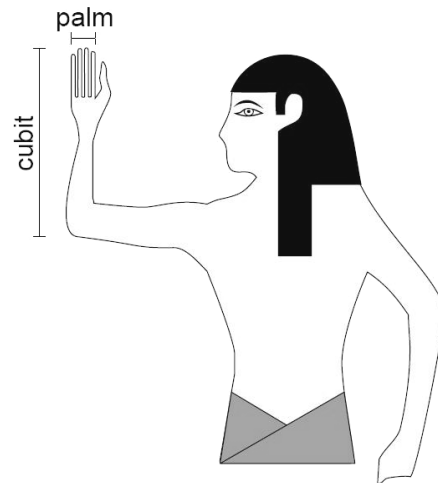
Comment

The correct answer, (D), was chosen by approximately 60% of the students who attempted the paper. The second most common answer was (A) (half of a pizza) which was chosen by almost 20% of the students. One half is the fraction that Year 3 students are most familiar with. Approximately 10% of the students chose (B) (three quarters of a pizza). This is the amount that the boys ate rather than the amount they had left over. The remaining 10% of the students chose (C) (one eighth of a pizza). This is half of the amount of pizza left over and thus the amount each boy left over.

Assessment Framework

Number & Arithmetic: Number
Ordering and comparing fractions

2. Some Ancient Egyptian measures of length were the cubit and the palm.



1 cubit = 7 palms

Which of these is equal to 5 square cubits?

- (A) 35 square palms
(B) 49 square palms
(C) 175 square palms
(D) 245 square palms

Worked Answer

Answer (D)

One square cubit is the same as 7×7 square palms. So 5 square cubits is the same as 5×49 square palms.

Comment

The correct answer was chosen by only a small number of students. The most common answer was (A). The question aimed to test some familiarity with the notion of square units but was posed in an unfamiliar context.

Assessment Framework

Measures & Units: Measures
Measuring and comparing areas

Measures & Units: Measurement
Solving measurement problems

Number & Arithmetic: Arithmetic
Squaring numbers

3. $945 \div 9 = ?$

- (A) 15
 (B) 100
 (C) 105
 (D) 150

Worked Answer

Answer (C).

$$\begin{array}{r} 105 \\ 9 \overline{)945} \end{array}$$

Comment

The correct answer, (C), was chosen by approximately 55% of the students who attempted the paper. The next most common response was (D) (150) which was chosen by almost 20% of the students. 150 is the answer students would obtain if they omitted the zero above the 4 and wrote the answer to $45 \div 9$ instead and then put a zero above the 5. Almost 15% of the students answered (A) (15). This answer results from omitting the zero above the 4. The remaining 10% of the students gave (B) (100) as their answer. 100 is the answer that students would obtain if they put zeros above both the 4 and the 5 because they are smaller than 9.

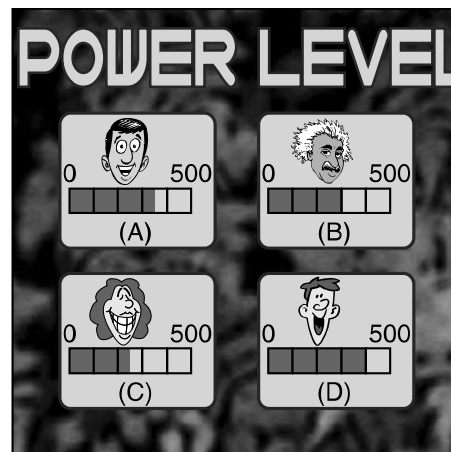
Assessment Framework

Number & Arithmetic: Arithmetic

Using the four operations with positive whole numbers

4. This screen shows the power level of four players in a computer game.

Which player has a power level of 350?



Worked Answer

Answer (A).

The scale showing each player's power level is labelled 0 at one end and 500 at the other. There are 4 graduations that are marked but not labelled. These must therefore represent power levels (from left to right) of 100, 200, 300 and 400. To represent a power level of 350 the scale must be shaded from 0 across to halfway between the graduations representing power levels of 300 and 400. This is true of scale (A).

Comment

The correct answer, (A), was chosen by approximately 85% of the students who attempted the paper. The next most popular response was (C) which was chosen by about 10% of the students. Option (C) shows a power level of 250 and is the only incorrect option that is shaded to halfway between 2 marked graduations. Only about 3% of the students chose (B) and the remaining 2% chose (D).

Assessment Framework

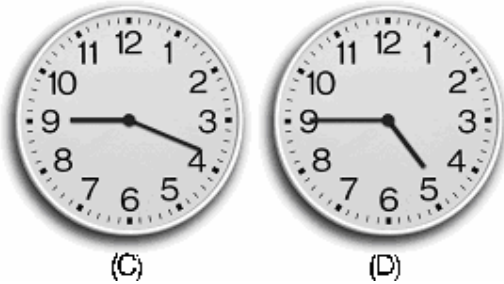
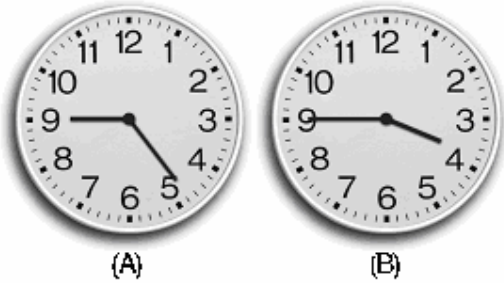
Measures & Units: Measurement

Reading scales that have integer intervals with gaps

Chance & Data: Data

Reading a column graph (bar chart)

5. Which clock shows 4:45?



Worked Answer

Answer (D).

The hour hand is three quarters of the way between the 4 and the 5. The minute hand is pointing to the 9.

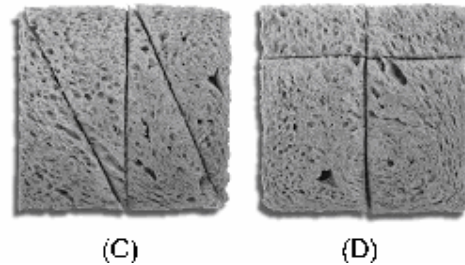
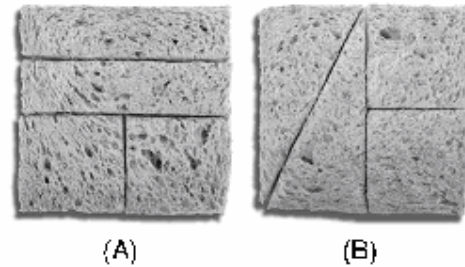
Comment

The correct answer, (D), was chosen by approximately 65% of the students who attempted the paper. The next most popular answer was (B) which was chosen by about 25% of the students. Option (B) has the minute hand in the correct place but the hour hand three quarters of the way between the 3 and the 4 rather than the 4 and the 5. About 5% of the students chose (A) which shows the minute hand where the hour hand should be and vice versa. The remaining 5% chose (C) which shows both the hour and minute hands reversed and points to the wrong hour.

Assessment Framework

Measures & Units: Measurement
Reading analogue and digital clocks

6. Which piece of bread is **NOT** cut into quarters?



Worked Answer

Answer (D).

The piece of bread in (D) has been cut into 4 pieces but these are not of equal size and are thus not quarters.

Comment

The correct answer, (D), was chosen by 75% of the students who attempted the test. The next most popular answers were (B) and (A) which were each chosen by about 10% of the students. The 4 pieces into which each of the slices of bread in (A) and (B) have been cut are different shapes but are of equal size. Only 5% of the students chose (C). These pieces are the same shape and size and only have different orientations.

Assessment Framework

Number & Arithmetic Number
Ordering and comparing fractions

Space & Geometry: Shape

Identifying by looking at shapes or solids which are the same or similar

7. Robert is hanging towels on a line.

He uses 3 pegs per towel but overlaps the towels so that towels next to each other share a peg.

This photo shows 3 towels hung this way.



Which of these shows how many pegs Robert would need to hang any number of towels this way?

- (A) $(2 \times \text{number of towels}) + 1$
 (B) $(2 \times \text{number of towels}) + 2$
 (C) $(3 \times \text{number of towels}) - 1$
 (D) $(3 \times \text{number of towels})$

Worked Answer

Answer (A).

To hang 1 towel, Robert would need 3 pegs. To hang 2 towels, he would need 5 pegs. To hang 3 towels, Robert needs 7 pegs. Thus the pattern is that the number of pegs Robert needs is twice the number of towels plus 1.

Comment

The correct answer, (A), was chosen by approximately 60% of the students who attempted the test. The next most popular answers were (B) and (C) which were each chosen by approximately 15% of the students. Option (B) allows 2 pegs per towel plus an extra peg at either end of the row of towels. Option (B) allows 3 pegs per towel minus the 1 peg that is shared by 2 towels. The remaining 10% of the students chose (D), 3 pegs for each towel ignoring the overlap.

Assessment Framework

Algebra & Patterns: Patterns

Choosing the correct description in words of a number pattern

8. Ben and Jenny measured the height of a pole using hand spans.

Here is a picture of Ben's hand span.



Ben found that the height of the pole is 8 of his hand spans.

The height of the pole is 12 of Jenny's hand spans.

How long, in cm, is Jenny's hand span?

Worked Answer

Answer 14.

The pole is 8 of Ben's hand spans. So the pole is $8 \times 21 \text{ cm} = 168 \text{ cm}$ high.

The pole is also 12 of Jenny's hand spans. So the Jenny's hand span must be $168 \text{ cm} \div 12 = 14 \text{ cm}$.

Comment

The correct answer was given by about 50% of students who attempted the question. The next most common answer was 17, given by about 10% of students. Altogether about 20% of students chose a number between 13 and 18 (other than the right answer). This suggests that many students made a brave attempt to estimate an answer.

Assessment Framework

Measures & Units: Measurement

Using the four operations with simple measurements