Reasoning in the classroom

Buying toys

Support materials for teachers

Year 2

Llywodraeth Cymru
Welsh Government

Year 2 Reasoning in the classroom – Buying toys

These Year 2 activities require learners to use their reasoning skills to solve problems.

Activity 1

Buying toys, version 1

Learners use two sets of information to find the costs of toys. This activity is suitable for more able learners.

Includes:

- Buying toys, version 1 question
- Markscheme

Activity 2

Buying toys, version 2

Learners use two sets of information to find the costs of toys. This activity is suitable for a wide ability range.

Includes:

- Buying toys, version 2 question
- Markscheme

Activity 3

Car launch competition

They investigate the consequences of using different angles to launch a car from a tube.

Includes:

- Explain and question – instructions for teachers

Reasoning skills required

Identify	Communicate	Review
Learners choose their own method to solve a problem and then to launch their car.	They talk about their ideas.	They review their decisions relating to the launch of the car, then refine their approach, developing their ideas and building on what they observe.

Procedural skills

- Money
- Simple halving/division
- Subtraction
- Measuring distances

Numerical language

- Angle (as in the amount of slope)
- Distance
- Units (measuring)
- Accurate

Activity 1

Buying toys, version 1

Activity 1 – Buying toys, version 1

Outline

This Year 2 activity requires learners to combine two pieces of information to solve a problem. It is demanding for the year group, so is suitable for more able learners. **Activity 2 – Buying toys, version 2** uses the same ideas, but with greater scaffolding, so is suitable for a wider ability range.

You can easily adapt these activities, or create further ones, by altering the costs and/or changing the items.

You will need

Buying toys, version 1 question
One page for each learner

Markscheme


1 car and 1 ball cost **70p**.

2 balls cost **40p**.

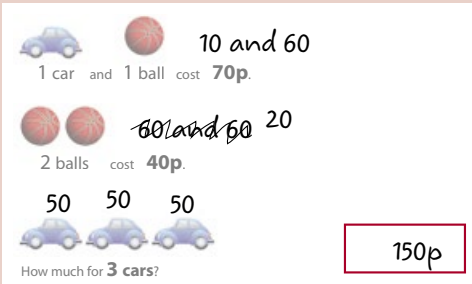
How much for **3 cars**?

3m

Activity 1 – Buying toys, version 1 – Markscheme and exemplars

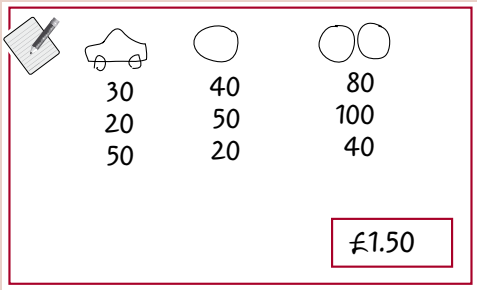
Marks	Answer
3m	**150p** or **£1.50**
Or 2m	Shows or implies 3 lots of 50p, e.g. • 150 • 1.50 • 50 × 3 • 50 + 50 + 50
Or 1m	Shows or implies that a ball costs 20p

◄ **For 3m, units must be shown**



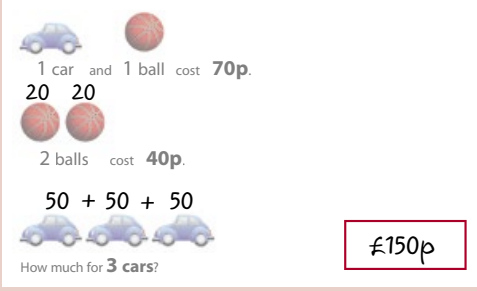
Correct; **3 marks**

- This learner starts with an incorrect assumption, that the car and ball cost 10p and 60p respectively, but they recognise and correct their error.



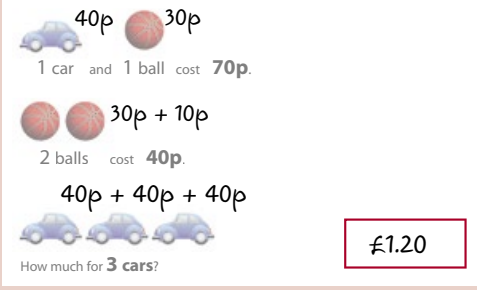
Correct; **3 marks**

- This learner has the confidence to try different values until they reach the correct solution. The use of trial and improvement is an important and effective numerical skill.



Shows 150; **2 marks**

- This learner shows understanding but has become confused with units. £150p is ambiguous and is therefore incorrect. However, £1.50p would be acceptable as it includes the decimal point.



Incorrect; **0 marks**

- '30p + 10p' suggests that this learner does not recognise that each ball must have the same cost.

Activity 2

Buying toys, version 2

Activity 2 – Buying toys, version 2

Outline

This Year 2 activity requires learners to combine two pieces of information to solve a problem. It is less demanding than **Activity 1 – Buying toys, version 1**, so is suitable for a wider ability range.

You will need

Buying toys, version 2 question
One page for each learner

Markscheme

2 balls cost **20p**.


1 ball and 1 car cost **40p**.

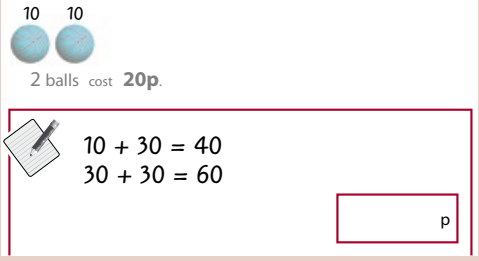
How much for **2 cars**?

p

3m

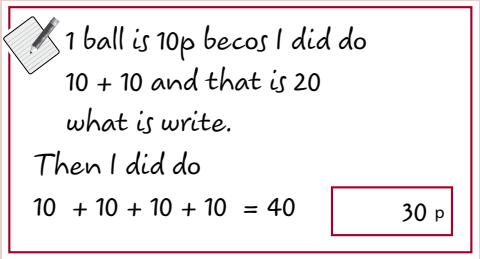
Activity 2 – Buying toys, version 2 – Markscheme and exemplars

Marks	Answer
3m	**60p**
Or 2m	Shows 30 ◄ **Cost of one car**
Or 1m	Shows 10 ◄ **Cost of one ball**



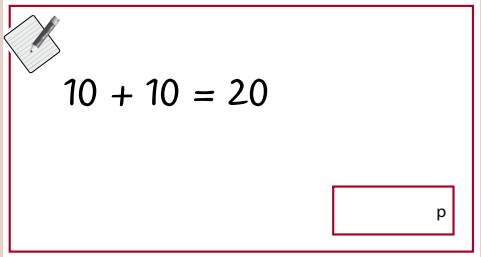
Correct; **3 marks**

- This learner shows good understanding. Their answer is shown in the working and because 'p' is given in the answer box it does not matter that the units are omitted.



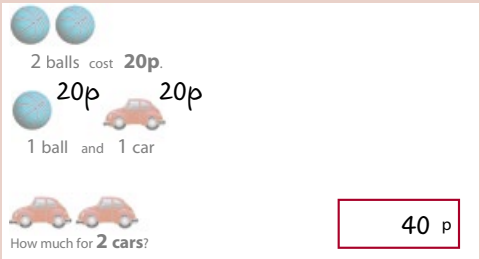
Shows 30; **2 marks**

- This learner shows understanding but has given the cost of one car, not two.



Shows 10; **1 mark**

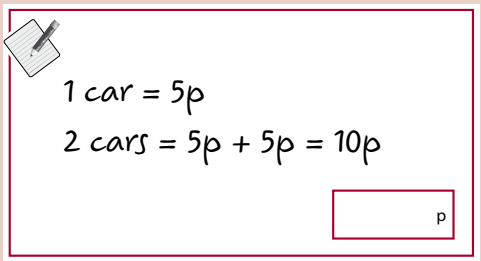
- The cost of a ball is clearly implied.



Incorrect; **0 marks**

Common error

This learner has ignored the fact that two balls cost 20p and has assumed that the ball and the car cost the same amounts. This is a common error.



Incorrect; **0 marks**

Common error

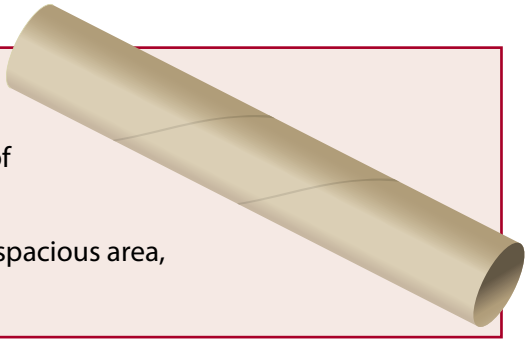
Another common error is to read only the last part of a question – this learner has decided that each car is 5p.

Activity 3

Car launch competition

Activity 3 – Car launch competition

Outline

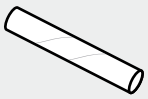


This activity introduces, in a simple and accessible way, the concept of angles and their relevance to real-life situations.

It is designed to take place outdoors, but could be carried out in any spacious area, such as the hall.

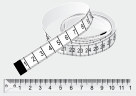
You will need

Each group/pair needs:



A long cardboard tube
(the inner tube of a roll of wrapping paper is ideal)

A toy car
(small enough to easily travel through the tube)



Ruler and/or tape measurer

Activity 3 – Car launch competition

Explain

Introduce the activity by saying you are going to have a competition to see who can make a car travel the furthest distance.

Show learners a tube, explaining that this is a tunnel and the car will be launched into the tunnel. The group that has the car that goes the furthest distance will be the winning group – but they must be able to measure correctly the distance it has travelled.

Give each group/pair a tube and a car, and tell them that they are top-secret designers. They should practise launching their car to decide for themselves how to make it go as far as possible, discussing in their group the different things they could try. Let them practise, working out for themselves how to maximise the launch *(e.g. not having the angle too flat, or too steep)*. Remind them of the need to measure accurately.

Then run the competition – each group starting at the same time to avoid being influenced by others.

Discuss the outcomes and support them in realising that the angle of the tube is the deciding factor. If it is too steep, the car just crashes as it hits the ground, and if it is too flat, it hardly moves.

Then let them all try again!

Question

- To make sure you get the best possible launch for your car, what do you need to think about?
- What happens if you stand the tube upright?
- What if it is flat?
- What do I mean by angle?
- How are you measuring the distance travelled? What units are you using? How can you check that you are accurate?
- Now you have practised, what do you need to change?
- Why do you think the winning car beat yours? What do you need to change?