

# **Bouncy castle**



**Support materials for teachers**



## Year 5 Reasoning in the classroom – Bouncy castle

These Year 5 activities start with an item that was included in the 2014 National Numeracy Tests (Reasoning). They continue with a linked activity, in which learners explore time intervals.

### Activity 1

#### Bouncy castle

Learners consider how much money can be taken in a defined time period on a bouncy castle.

Includes:

- Bouncy castle question
- Markscheme

### Activity 2

#### Five-minute relay

They explore time intervals through completing an activity in exactly one minute.

Includes:

- Explain and question – instructions for teachers



## Reasoning skills required

### Identify

Learners choose their own strategies.

### Communicate

They work together to complete tasks.

### Review

They review and amend their work, then reflect on what they would change if they were to repeat it.

## Procedural skills

- Time
- Money
- Multiplication and addition

## Numerical language

- Most
- Target

Activity 1

# Bouncy castle

---

## Activity 1 – Bouncy castle



### Outline

In this Year 5 activity, learners work out the maximum amount of money that can be made during a two-hour period on a bouncy castle.



### You will need



**Bouncy castle question**  
One page for each learner



**Markscheme**




## Bouncy Castle

Friday: open from  
**2pm to 4pm**

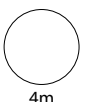
Each child pays  
**50p for 5 minutes**

No more than  
**6 children at any  
one time**

What is the **most** money that the bouncy castle owner can make on Friday?



£



4m

## Activity 1 – Bouncy castle – Markscheme

Marks	Answer	
4m	<b>£72</b> (but see note at the bottom of the page)	
Or 3m	Shows a method that would lead to 72 or 7200 if calculated correctly, even if there are numerical errors, e.g. <ul style="list-style-type: none"> <li>• <math>24 \times 0.50 \times 6</math></li> <li>• <math>24 \div 2 \times 6</math></li> <li>• <math>300 \times 24</math></li> </ul>	
Or 2m	Shows <b>36</b> or <b>3600</b>	◀ Total for one hour, in £ or p
	Or	
	Shows <b>24</b>	◀ Number of different slots
	Or	
	Shows <b>144</b>	◀ Number of children
Or 1m	Shows <b>12</b>	◀ Number of slots in one hour or total income in £ per child's place
	Or	
	Shows <b>3</b> or <b>300</b>	◀ Total per 5 minutes, in £ or p

**Note:** Although very unlikely, some learners could give alternative answers based on assumptions such as the one shown below. These assumptions must be explicit, e.g. for 4m accept:

- Each child will take 6 minutes because I think it will take one minute to get on and off, so 10 spaces each hour, each one gives £3, total £60

## Activity 1 – Bouncy castle – Exemplars

<p>Every 5 minutes it is 300p and there are 12 + 12 lots of those which is 24</p> <p>so it is 24 times 300</p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">£ 7200</div>	<p>Correct method; <b>3 marks</b></p> <ul style="list-style-type: none"> <li>This learner shows a correct method but confuses £ and pence to give an answer of £7200</li> </ul>
<p><del>5</del> <math>120 \div 5 = 24</math> <math>24 \div 6 = 4</math> <math>4 \times 50p \times 6 =</math></p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">£ 12</div>	<p>Shows 24; <b>2 marks</b></p> <ul style="list-style-type: none"> <li>This learner has worked out the number of slots but has then become confused. The method is incorrect and would not lead to £72</li> </ul>
<p>2 to 4pm                      60.00    12        30 0. <math>24 \times 5 = 120</math></p> <p>5                      50p for 5 mins 10        <del>10</del> 15                      2.500?</p> <p>6000    25.00    <del>£ 60.00</del>    <del>£150.00</del></p>	<p>Shows 24; <b>2 marks</b></p> <ul style="list-style-type: none"> <li>The lack of 'flow' within this working creates difficulties in understanding the method used: this could form a discussion point after the test. However, the value 24 is clearly shown.</li> </ul>
<p>2hrs    12 5 minutes in 1hr    £6 in 1hr per child</p> <p><math>£6 \times 6 = £36</math> <math>6 \times £36 = £216</math>    <math>2 \times £216 = £432</math></p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">£ 432</div>	<p>Shows 36; <b>2 marks</b></p> <ul style="list-style-type: none"> <li>This learner communicates effectively. Without the additional <math>\times 6</math> this would be a correct method.</li> </ul>
<p>£3.00                      <math>120 \times 50p = 6000</math></p> <p>   <math>£63.00</math></p> <div style="border: 1px solid black; padding: 2px; display: inline-block;">£ 63.00</div>	<p>Shows 3; <b>1 mark</b></p>

Activity 2

## Five-minute relay

---



## Activity 2 – Five-minute relay



### Outline

This activity starts with learners deciding whether five minutes on a bouncy castle is a reasonable length of time. They then plan their own activities to run a relay 'race' where five learners in turn carry out an activity for exactly one minute.

**Activity 2 – Five-minute relay** is a practical and fun activity that enhances understanding of time intervals, and also encourages learners to work cooperatively to achieve the task.



### You will need



One stopwatch for each group of five learners

## Activity 2 – Five-minute relay



### Explain

In **Activity 1 – Bouncy castle** children were allowed five minutes each on the castle. Do learners think that is long enough? Would it be long enough if they were to bounce solidly, without stopping? Is five minutes a short or long time? (*Don't respond to this at this stage, as they are going to find out.*) Ask them to raise one arm into the air. They are to keep it there for five minutes. When they think the five minutes is up, they lower it. (*The outcome is likely to be that they lower their arms well before you call time – five minutes is a very long time to hold your arm in the air!*)

Split learners into groups of five (*if a group has four, one person takes part twice in the game*) and give each a one-minute timer. Their task is to each do something for exactly one minute but in turn, just like in a relay race. The rules are similar to a relay race – when the first person decides their one minute is up, they shout 'go' to person number two who then starts their minute, and so on.

They need to decide on five different ways to 'fill' their minutes. They can do anything they like – a physical activity like jumping up and down or skipping, standing like a statue, reading, drawing – anything, so long as each person does something different, and it lasts exactly one minute. Easy! However . . . they have the timer for practice, but when they run the relay they won't have anything at all to measure time! (*Make sure none of them have watches, and cover clocks.*)

Allow time for them to plan their strategy, giving as little support as appropriate so the decisions are their own, then allow them time to practise. (*They are likely to need encouragement to practise individually as well as a group, to maximise the time they have available. However, this activity could be started in the morning, then run at the end of the day, so they can practise informally at breaks if they choose.*)

When you run the activity, groups either present individually, or two groups present simultaneously, depending on numbers. The winner is the group that finishes closest to the magical five minutes.



### Question

- How are you going to try to be as close as possible to one minute when you take part in the relay? (*Count how many repetitions of your activity there are in one minute, or use a method to count to one minute, e.g. one elephant, two elephants, etc.*)
- Are you going to decide when your time is up – or is someone else going to? Why?
- How are you organising your practice? Have you a plan? Is everyone having a turn? Are you making sure everyone knows what they are doing and are happy with the plan?
- Are some activities easier to time? (*Anything with a rhythm, e.g. clapping. But the activity can be incidental if they ignore what they are doing and instead count out the minute.*)
- Are you reviewing what you are doing and amending it as you go? How?
- How confident are you of your timing? What if someone goes wrong? What will you do?
- Your total time was xxx. How far off the target five minutes were you?
- Was it difficult to get this right? Why? What would you do differently now? Why?