AFRICAN INSTITUTE FOR MATHEMATICAL SCIENCES
SCHOOLS ENRICHMENT CENTRE (AIMSSEC)
AIMING HIGH

PEACHES

Story 1 A generous little monkey had some peaches.

On the first day he gave half his peaches away and ate one.

On the second day he gave away half of the rest and ate one.

On the third day he gave away half of the rest and ate one.

On the fourth day he found there was only one left.

How many did he have at the beginning?

Story 2 Another generous little monkey who liked mathematics had 60 peaches.

On the first day he decided to keep $\frac{3}{4}$ of his peaches.
He gave the rest away then he ate one.

On the second day he decided to keep $\frac{7}{11}$ of his peaches.
He gave the rest away then he ate one.

On the third day he decided to keep $\frac{5}{9}$ of his peaches.
He gave the rest away then he ate one.

On the fourth day he decided to keep $\frac{2}{7}$ of his peaches.
He gave the rest away then he ate one.

On the fourth day he decided to keep $\frac{2}{3}$ of his peaches.
He gave the rest away then he ate one.

How many did he have left at the end?

HELP

You could work backwards to solve Story 1

Day	Number eaten and saved	Number given away	Number at start of day
4			1
3			
2			
1			

NEXT

Peaches Today, Peaches Tomorrow

A monkey has 75 peaches. Each day, he kept a fraction of his peaches, gave the rest away, and then ate one.

These are the fractions he decided to **keep**:

$$\frac{1}{2} \quad \frac{1}{4} \quad \frac{3}{4} \quad \frac{3}{5} \quad \frac{5}{6} \quad \frac{11}{15}$$

In what order did he use the fractions so that he was left with just one peach at the end?

nrich.maths.org

Click here for a pdf of this NRICH poster.

NOTES FOR TEACHERS

SOLUTION

Work backwards to solve Story 1

Day	Number eaten and saved	Number given away	Number at start of day
4			1
3	1 eaten and 1saved	2	4
2	1 eaten and 4 saved	5	10
1	1 eaten and 10 saved	11	22

Story 2

45 is $\frac{3}{4}$ of 60 so he gave away 15, ate one and saved 44.

28 is $\frac{7}{11}$ of 44 so he gave away 16, ate one and saved 27.

15 is $\frac{5}{9}$ of 27 so he gave away 12, ate one and saved 14.

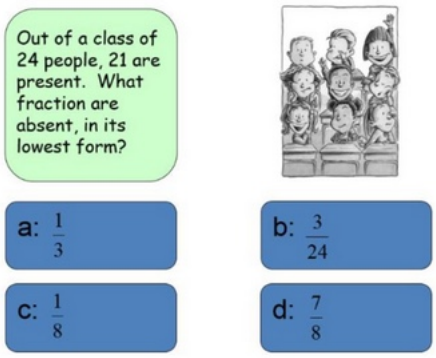
4 is $\frac{2}{7}$ of 14 so he gave away 10, ate one and saved 3.

2 is $\frac{2}{3}$ of 3 so he gave away 1, ate one and

there was one left at the end.

Diagnostic Assessment This should take about 5–10 minutes.

1. Write the question on the board, say to the class:
   "Put up 1 finger if you think the answer is a., 2 fingers for b, 3 fingers for c and 4 fingers for d".



2. Notice how the learners responded. Ask a learner who gave answer A to explain why he or she gave that answer and DO NOT say whether it is right or wrong but simply thank the learner for giving the answer.
3. Then do the same for answers B, C and D. Try to make sure that learners listen to these reasons and try to decide if their own answer was right or wrong.
4. **Ask the class again to vote for the right answer by putting up 1, 2, 3 or 4 fingers. Notice if there is a change and who gave right and wrong answers.** It is important for learners to explain the reason for their answer otherwise many learners will just make a guess.
5. If the concept is needed for the lesson to follow, explain the right answer or give a remedial task.

The correct answer is c.

Learners giving answer a. and d. have not understood the question

Learners giving answer b. have not reduced the fraction to its lowest terms.

https://diagnosticquestions.com

Why do this activity?

This activity could replace repetitive textbook work on calculating fractions. It offers plenty of practice of these calculations as well as practice in reading and interpreting questions and in problem solving.

Learning objectives

In doing this activity students will have an opportunity to:

- practise reading and interpreting questions;
- practise calculations involving fractions.

Generic competences

In doing this activity students will have an opportunity to:

- **think mathematically,** reason logically and give explanations;
- interpret and **solve problems**.

Suggestions for teaching

Introduce the first part of the problem to the class and give them a few minutes to read the question and think about how to tackle it. You could then have a class 'brainstorming' session for a few minutes in which learners suggest methods they could try. Probably someone will suggest that you could work backwards from the fourth day. Then give them time to work in pairs to solve it.

Once learners have had a chance to work on the first challenge, share strategies as a whole class and discuss any difficulties that arose.

The second task is in some ways simpler. Give them time to work in pairs to solve it. Then ask some learners to present their solutions to the class.

Key questions

- What do you know from the story that you can use to find …
- Can you explain how you found that answer?
  (Remember – this is more helpful to the learner than pointing out his mistake)
- How will you record your work efficiently so that you can keep track of what is happening?

Story 1

The monkey had 1 peach on day 4 so what do you think happened on day 3?

Story 2

How many peaches did he give away?
How many did he save for the next day?

Follow up

See https://nrich.maths.org/2312 for this extension to the Peaches problem.
Whenever the monkey has some peaches, he always keeps a fraction of them each day, gives the rest away, and then eats one.
I wonder how long he could make his peaches last for...
Here are his rules:

- Each fraction must be in its simplest form and must be less than 1.
- The denominator is never the same as the number of peaches left.
  For example, if there were 45 peaches left, he would not choose to keep $\frac{44}{45}$ of them.

Can you start with fewer than 100 peaches and choose fractions so that there is at least one peach left after a week?

Starting with fewer than 100, what is the longest you can make the peaches last?
For the solution see https://nrich.maths.org/content/id/2312/keane%20and%20michael.pdf

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA, to Years 4 to 12 in the UK and up to Secondary 5 in East Africa. New material will be added for Secondary 6. The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is beyond the school curriculum for Grade 12 SA. For resources for teaching A level mathematics see https://nrich.maths.org/12339				
	Lower Primary or Foundation Phase Age 5 to 9	Upper Primary Age 9 to 11	Lower Secondary Age 11 to 14	Upper Secondary Age 15+
South Africa	Grades R and 1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
USA	Kindergarten and G1 to 3	Grades 4 to 6	Grades 7 to 9	Grades 10 to 12
UK	Reception and Years 1 to 3	Years 4 to 6	Years 7 to 9	Years 10 to 13
East Africa	Nursery and Primary 1 to 3	Primary 4 to 6	Secondary 1 to 3	Secondary 4 to 6