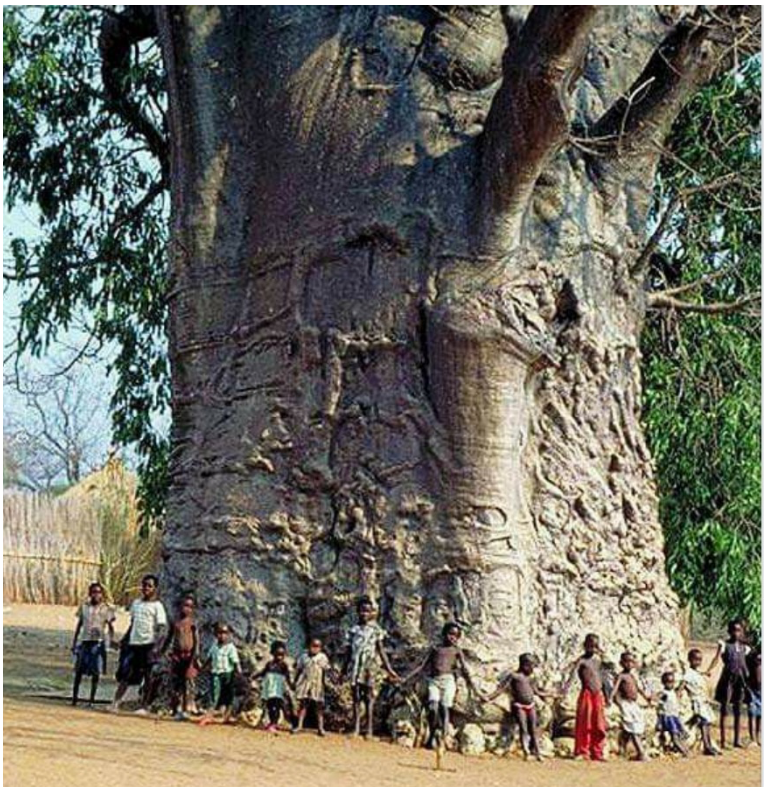
ESTIMATE MY GIRTH



This baobab tree in Senegal is reported to be 6000 years old.

Try to estimate the distance around the tree trunk at its base measured in metres.

Count the children in the picture. Suppose there are children all round the tree and close to it. How many do you think there would be?

Does the picture give you an idea how you might use it and, with your class at school, work out an estimate of the distance around the base of the tree trunk?

HELP

You could make estimates of lengths and distances in and around the school in a similar way.

NEXT

What can you find out about baobab trees? Make a poster with a scale drawing of a baobab tree showing other measurements such as heights and diameters of the tree.

NOTES FOR TEACHERS

SOLUTION

There is no correct answer here.

The picture shows 14 children standing around the tree holding hands so we can estimate that to go all the way round the tree would take 28 children.

Either 28 learners could stand in line holding hands, copying the children in the picture, and then measure how far from end to end of the line

Or: The whole class could stand in line holding hands and then measure how far from end to end of the line and then calculate the mean distance between their hands, the span, for each learner.

Suppose that, on average, the span for each child, that is the distance between their hands, is 80 cm then an estimate of the distance all the way round the tree (the girth) would be 28 × 80 cm = 2240 cm or about 22 metres.

It is known that baobab trees grow to as much almost 30 metres around and a diameter of 9 to 10 metres so our estimate is reasonable.

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".

Here is a drawing of a bus.

Which **one** of the following is the **most reasonable** estimate of the height of this bus?

A 2 m

B 4 m

C 7 m

D 10 m

2. Notice how the learners respond. 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.

5. As the concept will be explored in the lesson to follow, you might like to use this quiz again at the end of the lesson.

B. is the correct answer

Many learners will just make a guess so it is important to ask them to give reasons for their answers.

Common Misconceptions

A. The man is about 1m so the bus is double that.

Do the learners have a concept of a metre length and heights of people?

C. 2 meter headroom, 2 floors and 4 meters for seating plus a bit for the floors and undercarriage with space underneath as it is off of the ground.

Good reasoning but an overestimate.

D. You would round to the closet 10m.

https://diagnosticquestions.com

Why do this activity?

In every day life it is often useful to be able to estimate lengths and distances and people need a lot of practice in doing this before it comes naturally. This activity gives learners experience of estimating and visualising lengths, without requiring any knowledge of the formula for the circumference of a circle. The activity could also involve a practical experience of working out and using a mean. This prepares learners to think mathematically in ways important to data handling. Learners experience two stages:

1. Guessing the length based on what they know about length.
2. Doing a calculation that gives them an estimate of the length.

Learning objectives

In doing this activity students will have practical experience of:

- measuring, estimating, recording and comparing lengths using string, tape measures, rulers or metre sticks
- deciding on the most appropriate unit for the answer, that is: millimetres (mm) or centimetres (cm) or metres (m) or kilometres (km) and of conversion between these units
- solving problems in contexts involving length
- using the mean for a population in estimating lengths.

Generic competences

In doing this activity students will have an opportunity to:

- **think flexibly**, be creative and innovative and apply knowledge and skills;
- **visualize** and develop the skill of interpreting and creating visual images to represent situations;
- **work in a team** to solve a problem by practical means.

Suggestions for teaching

Resources: A length of string knotted at 10 cm intervals. This takes some time to make but it can be used many times in different lessons.

You might find string useful for this. Also you might like to use the images on page 4 and start the lesson with the diagnostic assessment and discussion about it. Can the learners show you roughly a length of a metre? Do they know roughly how tall adults are and roughly how tall the learners in the class are?

Then show the learners the picture of the baobab tree on page 5 and ask for suggestions about how to find an estimate of the distance all round the tree (the girth). Ask: “How many children in the picture?” “How many to go all the way round the tree? “

You could do an experiment with 28 children from the class standing in a line like the children in the picture, and measure the length of the line.

Alternatively the whole class could stand in line holding hands as in the picture and then measure how far from end to end of the line. Then they could find the mean distance between their hands, that is the span, for each learner. Are the children in the class about the same heights as the children in the picture, or shorter or taller? Should they take a different mean for the calculation to find the distance around the tree?

Key questions

- What does the picture show?
- How could you estimate the distance around the tree?
- How many children are in the picture?
- How many children would go all the way round the tree?
- How much distance around (length), on average, for each child? How could we estimate that?
- How similar are we to the children in the picture?
- How can we work out the mean span for our class if we stood around the tree?

Follow up

Metre Measures https://aiminghigh.aimssec.ac.za/years-3-7-metre-measures/

Note: The Grades or School Years specified on the AIMING HIGH Website correspond to Grades 4 to 12 in South Africa and the USA and to Years 4 to 12 in the UK.				
	Lower Primary or Foundation Phase	Upper Primary	Lower Secondary	Upper Secondary
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