

JUST A MINUTE - 30 MINUTE LESSON



How long is a minute?

What can we do in a minute?

You will need: 2 stopwatches, paper & pencils (or other recording implements).

Activity 1: Estimate a minute

Sit with your head on your arms so that you will not be distracted. When the timekeeper says GO start to estimate or guess when a minute has passed, and when you think a minute has passed sit up and raise a hand. How accurate

was your guess?

The timekeeper will make a tally of how many learners sat up in 10 second segments of the minute as an indication of how accurate the group are as a whole. How many guesses in the class were less than a minute and how many are still 'heads down' when a minute is up.

Now that you have experienced what a minute feels like, this exercise will be repeated and recorded as before. Were you more accurate the second time?

Activity 2: How many jumping jacks in a minute?

The second activity will help you 'feel' a minute. How many jumping jacks can you do in a minute?



Description of a jumping jack:

*Begin with the feet together and hands by the sides. Jump on the spot like the teacher in the picture, landing with the feet apart and hands raised so that the arms and legs form an X. Jump again landing back in the first position. This counts as **one jumping jack**.*

How many jumping jacks do you think you will be able to do in a minute? Work with a partner. One of the pair will jump and the other will count when the timekeeper, using a stopwatch, give a signal to start and stop jumping. The counter notes down the number that their partner did and then you swap roles and repeat the exercise. Keep the records of how many jumps you did.

Activity 3: Re-estimate a minute

How could you make your estimates more accurate? There are 60 seconds in a minute. Another method of estimating time is to count one one thousand, two one thousands, three one thousands and so on up to 60 one thousands. Another counting method is 'one Mississippi, two Mississippi,' etc. up to 60 Mississippi.

Repeat Activity 1 and compare the accuracy with your first attempt. Which method was the best?

HELP

To get a good idea of how long is a minute, look at a clock or watch with a second hand, and keep looking at the second hand as it goes round one complete revolution in one minute.

Write down the numbers 1 to 60. How long did it take? Write them a second time and see how close they can get to writing the numbers 1 to 60 in 60 seconds. How can you pace yourself to get as close to 60 numbers in 60 seconds as possible?

NEXT

What other things can you do in 60 seconds to create your own timer? This could be bouncing a ball, or writing out tables facts!

Work out how many minutes in a day, in a week, and in a year. How many minutes have you been alive? What do you need to know to make this calculation accurately? *E.g. Leap years, exact time of birth*

NOTES FOR TEACHERS

SOLUTION There is no solution to this activity. It is just a learning experience.

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 number of minutes in 24 hours is:

A. 3600 B. 1440 C. 60 D. 87840

The correct answer is B : $60 \times 24 = 1440$

A. This is the number of seconds in one hour.

C. This is the number of minutes in one hour.

D. This is the number of seconds in 24 hours.

<https://diagnosticquestions.com>

Why do this activity?

It is useful to be able to estimate time and this activity gives learners practice at it.

Learning objectives

In doing this activity students will have an opportunity to learn more about time measurement and to practice estimating short intervals of time.

Generic competences

- **think flexibly**, be creative and apply knowledge and skills;
- **develop the life skill** of estimating time.

Suggestions for teaching

Tell the class that in this lesson they will estimate a minute and find out how many jumping jacks they can do in a minute. Allow a short time here for learners to ask questions and for any organisational issues, e.g. making the space safe for jumping.

Depending on the age/attainment level of the young mathematicians in your class, you may want to ensure they know that there are 60 seconds in a minute.

Activity 1: Estimate a minute

Tell the learners that they will be sitting with their heads on their arms so that they will not be distracted. When you say go, they will start to estimate or guess when a minute has passed and when they think they have reached a minute sit up and raise a hand.

Note how many guesses are less than a minute and how many learners are still ‘heads down’ when a minute is up. You may want to make a tally of how many learners sat up in 10 second segments of the minute as an indication of how accurate the group was as a whole.

If an interactive whiteboard is available, use a silent timer on that, so that learners can record for themselves how many seconds had passed when they sat up.

Repeat the exercise now that the learners have experienced what a minute in that situation feels like and record as before. Discuss whether the second attempt was more or less accurate.

Explain that the next activity will help them ‘feel’ a minute.

Activity 2: How many jumping jacks in a minute?

Firstly, ensure that all of the learners understand what a jumping jack is. Have one learner give a demonstration if possible, so that all are doing the same exercise.

Description of a jumping jack:

*Begin with the feet together and hands by the sides. Jump on the spot, landing with the feet apart and hands raised so that the arms and legs form an X. Jump again landing back in the first position. This counts as **one jumping jack**.*

Divide the group into pairs. In each pair one learner will jump and the other will count. Have each pair estimate how many jumping jacks they think they will be able to do in a minute. Using a stopwatch, give a signal to start and stop jumping. (A whistle will be useful here if available.)

The counter notes down the number of star jumps that their partner did and then they swap roles and repeat the exercise.

At the end of the activity keep the records of how many jumps learners did as you may want to use them later depending on which follow up activities you intend to use.

Activity 3: Re-estimate a minute

Discuss the various ways the learners could make their estimates more accurate. Some learners may want to try to use the number of jumping jacks they did to help them ‘count’ a minute.

Others may have heard of other methods, such as ‘one one thousand, two one thousand, three one thousand, etc. Or they may have come across ‘one Mississippi, two Mississippi,’ etc.

Repeat **Activity 1** and compare the accuracy with the first attempts.

Discuss which methods were the most effective and give the learners a chance to have a go at one of the others.

This completes the 30 minute lesson. You may wish to follow on with some of the linked activities in the Follow up.

See <https://www.bubblymaths.co.uk/maths-resources/>

Every year AIMSSEC and Bubbly Maths, with HeyMath! and now the Royal Institution, run an **Annual Global Maths and Science Lesson** in October involving many thousands of learners in schools around the world who do the same 30-minute lesson on the same day. We no longer try to break a Guinness World Record but we are setting our own records. In 2017 th topic was Estimating Time and this was the activity for the Global Lesson.

Key questions

- Was your estimate more or less than a minute?
- Can you practise counting 60 seconds at a very steady pace: one Mississippi, two Mississippi, three Mississippi ... sixty Mississippi, and do this several times adjusting your count to estimate one minute accurately?
- How many steps can you take in a minute?
- How far can you walk in a minute?
- How far can you run in a minute?

Follow up Mathematics

Use the results and get the learners to work out the margin of error with the 60 second estimates.

Find the mean (add the errors together and divide by the number of learners). Does this give a more accurate estimate? *There is a theory called 'The Wisdom of Crowds'. This says that if you ask a number of people to estimate something and then find the mean, this will be more accurate than an individual guess. Use stones in a jar or the weight of something and see if it works for your group.*

Find the mean of the number of jumping jacks.

Work out how many minutes in a day, week, year. How many minutes have you been alive? What do you need to know to make this calculation accurately? *E.g. Leap years, exact time of birth.*

Have the learners write down the numbers 1 to 60. How long did it take? Write them a second time and see how close they can get to writing the numbers 1 to 60 in 60 seconds. How can you pace yourself to get as close to 60 numbers in 60 seconds as possible?

Why do we use twenty-four hours in a day, sixty minutes in an hour and sixty seconds in a minute? The other measurements we use are based on the decimal system, that is in 10s or multiples of 10. Twenty-four and sixty can be divided in many more ways than, for example, twenty and fifty or one hundred which would be the alternatives if time were decimalised. This makes it easier to divide a day into work/school, free time, sleep etc.

Use this as an activity to introduce/practice factorising. Compare the number of factors in twenty with those in twenty-four. It is useful for younger learners to have equipment to use to help find the factors – e.g. counters, stones, chairs or even people! How many ways can we arrange the twenty-four counters so that we have rows and columns exactly the same with none left over? *Visual learners – even the highest attainers – will benefit from seeing the factors as arrays rather than just numbers on a page.*

Alternative idea for young and low attaining learners: Count up to 60 as group, in a circle jumping on the emphasised number following a rhythm.

Count in:	How Many Counts?		Count in:	How Many Counts?
Ones	60		Fours	15
Twos	30		Sixes	10
Threes	10		Tens	6

Science

Investigate/research why we have a leap year every four years. How can we tell if a year is a leap year without counting back/on?

History of Mathematics

The article 'A brief history of time measurement' <https://nrich.maths.org/6070> is written for secondary school students and it is also a good resource for primary teachers.

The Babylonians used a sexagesimal system (counting in 60s) which is why minutes and hours are still counted in 60s.

You may want to look into other ancient civilisations such as the Greeks, Romans and the Arabic peoples to find what their contributions have been to the Mathematics we still learn today.

Useful links for time resources:

Time activities on the AIMING HIGH Teacher Network website:

Run your own professional development workshop using this AIMSSEC Workshop guide:

PRIMARY TIME <https://aiminghigh.aimssec.ac.za/primary-m1-time/>

Time 1 <http://bit.ly/timedig> Matching times shown on traditional clocks to times written digitally (in number).

Time 2 <http://bit.ly/timewd> Matching times shown on traditional clocks to times written in words.

Time 3 <http://bit.ly/clocks12and24> Matching times given on the 12 hour clock with times given on the 24 hour clock and putting them in order.

Thousands and Millions <http://bit.ly/thousandsandmillions> Questions to investigate such as: 'What year was it one billion minutes ago?'

Right Time <http://bit.ly/righttimeactivity> The hands of a clock are at right angles at three o'clock. When are they at right angles again. Be careful, it is not at three thirty.

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. For resources for teaching A level mathematics see <https://nrich.maths.org/12339>
Note: The mathematics taught in Year 13 (UK) and Secondary 6 (East Africa) is beyond the school curriculum for Grade 12 SA.

	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