How Many Steps to the Moon?

SD-B138 / STRATEGISTS · AGES 10–12

Make a rough estimate by breaking a huge question into small known facts.

YOU NEED: Pencil; a calculator is optional

ANALYZE	The Moon is about 384,400 km away. Guess how many of your steps it would take.
CHOOSE	Break it up: 1 km = 1,000 m. A step is about 0.6 m. How many steps make 1 km?
TEST	Multiply to estimate the steps to the Moon. How long if you walk 100 steps a minute?
REFLECT	Is the answer closer to your guess than you expected? Why do estimates help?

MY ESTIMATE

	My work	Answer
Steps in 1 km		
Steps to the Moon		
Minutes at 100/min		
Years (24 h/day)		

My first guess

My guess was

What I learned

Estimating helped because

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A little help beside the learner. Read this page first; keep the answers here.

LEARNING GOAL
Practice estimating a huge quantity by splitting it into known parts.

BEFORE YOU BEGIN
You need: Pencil; a calculator is optional. None needed beyond pencil and paper.

HOW TO GUIDE
Round freely: about 1,700 steps in a kilometer, so about 640 million steps to the Moon. At 100 steps a minute that is roughly 12 years of nonstop walking. A calculator is fine. The skill is breaking the big question into small ones.

WHY IT MATTERS
Estimating builds number sense and confidence with big questions. It shows that a rough answer built on clear steps beats a wild guess.

LOOK FOR THIS REASONING
Look for the question broken into small known facts, rounding that is sensible and a final answer with units.

IF THEY GET STUCK
Ask: what do you know that you could use? How many of those would make 1 km? Then how many kilometers are there?

MAKE IT GENTLER
Estimate just how many steps make 1 km.

ADD A LITTLE STRETCH
Estimate the same for a car or a bike.

A USEFUL STOPPING POINT
Pick another huge number to estimate and try it.