

# Bringing Maths to Life (Levels 1-2)

Read the questions below carefully and see if you can use your mathematical skills to solve the problems all the way to Level 3.

If you're struggling to solve the problem, the tip might be able to help you.

Question	Tip	Answer
Level 1 - The comet in the conundrum is in an orbit that means it is seen from earth every 1,001 years. If it was spotted first in this year, when is the next time it will be seen from earth?	Add 1,001 to the year it was first spotted to find the next appearance.	
Level 1 - Halley's Comet is one of the most famous comets. It is visible on earth about every 76 years. The next time Halley's Comet will be visible from earth is 2062. When was the last time it was visible from earth?	Subtract 76 from 2062 to find the previous appearance.	
Level 1 - A student wanted to create a stargazing club. The group met once a week in the evening at a local park. In the first meeting, it was just the group creator so 1 person was there. The second meeting there was 2 people there. The third meeting had 3 people. The 4th meeting had 5 people. The 5th meeting had 8 people. If this pattern continues, how many people will be at the 12th meeting?	Add the last two numbers together to get the next number in the pattern!	
Level 2 - A city is wanting to build an observatory. If the city wants the building to have 200 square meters of space. What are all whole number combinations for the floor area?	There are 6 pairs of factors that could create a 200 square meter floor plan.	
Level 2 - One of the most famous comets is called Halley's Comet. The comet completes its orbit about once every 76 years. If it travels a total of 12.2 billion kilometers (7.6 billion miles) over that time, what is its approximate average speed in km/hr?	Divide the total distance by the time taken (in hours) to find the average speed. Remember there are 24 hours in a day and 365 days in a year.	
Level 2 - If I am able to see a comet that is 15 km (9.3 mi) at its widest point from 4.94 million km (3.07 million mi) away, using proportions, how big would a rock need to be at its widest point for me to see it from 32.2 km (20 mi away)?	Set up a proportion based on the sizes and distances of the comet and the rock.	

# Bringing Maths to Life (Levels 3-5)

Read the questions below carefully and see if you can use your mathematical skills to solve the problems all the way to Level 3.

If you're struggling to solve the problem, the tip might be able to help you.

Question	Tip	Answer
Level 2 - A school is organizing a stargazing event. The school has 613 students and the school can get as many buses as it needs to transport the students. Each bus can hold 24 students and costs \$30 for renting and gas. How much money will the transportation cost?	First we need to figure out how many buses will be needed. Then we will multiply the number of buses by their cost.	
Level 2 - Mo wants to read a space book that is 125 pages long. Mo reads 1 page every 20 seconds. It is currently 5:00pm and the family is leaving for dinner at 5:30. How many pages will Mo have left when the family leaves for dinner?	First figure out how many pages Mo reads in a minute. Then see how many pages Mo can read in the 30 minutes before the family leaves for dinner. Finally subtract the number of pages Mo reads from the total number of pages in the book!	
Level 2 - It has been determined that at a certain location there is a 40% chance of viewing a meteor each night. What is the probability that a person goes out three nights in a row yet doesn't see a meteor?	Since there is a 40% chance of seeing a meteor, there is a 60% chance to not see a meteor each night. To determine the end probability of not seeing a meteor three nights in a row, we calculate $60\%^3$ .	
Level 3 - Pretend the comet in the conundrum was accelerating at a rate of 4 meters per second squared. How long would it take for the comet to increase in speed by 10 km/sec?	First change all values into meters. Then see how many seconds it will take to accelerate the given amount by dividing the speed by the acceleration. Make sure the units are appropriate!	
Level 3 - The formula for momentum is $p = mv$ . First, create a clear and concise definition of momentum. Second, assuming a speed of the comet of 18,335 km/hr and a mass of $2.2 \times 10^{14}$ kg, what is the momentum of Halley's Comet?	Multiply the speed by the given mass to find the momentum. The mass is given in scientific notation since it is a large number! You may need to look that up :)	
Level 5 - A comet moves in an elliptical orbit around the earth. Search online for the formula for an ellipse in terms of its major and minor axes. If the ellipse representing a comet's orbit is $196\pi$ , what are all of the positive integer combinations that are possible for the major and minor axes?	Remember, the formula for the area of an ellipse is $\pi \times a \times b$ where 'a' and 'b' are the semi-major and semi-minor axes, respectively.	