

# INVESTIGATIONS

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## FAIRY TALES

Fairy tales provide wonderful contexts for exploring a variety of important mathematical ideas. Read or retell one of these fairy tales to students and undertake the associated investigation. Afterwards, invite students to reflect on their own favourite fairy tale and then have a go at devising their own narrative-driven, mathematical inquiry.

### THE ELVES AND THE SHOEMAKER EXPONENTIAL GROWTH

After the first night, the elves made shoes of such excellent quality that the shoemaker was able to use the money from the sale of the shoes to purchase enough material to make two new pairs of shoes. After the second night, the two pairs of shoes the elves made were again of excellent quality, and the shoemaker was able to sell them and purchase enough material to make four pairs of shoes. Assuming this pattern continues, how many shoes will the elves make in one week?

After doing this for some time, the shoemaker decides not to buy any more material. Instead, he will sell the shoes, keep the money and retire to The Bahamas as the richest person in the world. If he sells a pair of shoes for \$100, estimate how long the shoemaker waited until he retired. Now use the Internet to find out how rich the richest person in the world is, and use Microsoft Excel or a similar program to work out how long it took the shoemaker to get this rich (Hint: remember he only keeps the money for the shoes made on the last day).

### GOLDBLOCKS PROPORTIONAL REASONING AND PERCENTAGE CHANGE

When Goldilocks ate baby bear's porridge it was 'just right' - 50 degrees Celsius to be precise! However, she could easily have eaten the first two bowls of porridge instead! If the first bowl was too hot (it was a scorching 80 degrees) and the second bowl was too cold (only 40 degrees) how much of each porridge would she need for a 100 gram bowl of 'just right' porridge? How long would Goldilocks have to wait for the 'too hot' bowl to be 'just right' if it cooled at 10% every minute?

### SLEEPING BEAUTY MULTIPLICATIVE THINKING AND PROBABILITY

Aurora pricks her finger on a spinning wheel on her 16th birthday and a curse puts her to sleep for 100 years. Imagine if the prince never found her and she slept for all 100 years, she would miss out on a lot! Aurora is a big sports fan. How many Olympic Games would she miss? How many tennis grand slams would she miss? She normally watches every Richmond Tigers AFLW and AFL game. How many would she miss? Do you think it is likely or unlikely that every AFL club will win at least one premiership while Aurora was asleep? Explain your reasoning. (Hint: Students may wish to gather some data using a 20-sided dice to support their argument).



### JACK AND THE BEANSTALK ESTIMATION AND LENGTH

In Jack and the Beanstalk, Jack climbs the beanstalk into the clouds and there he finds the land of giants. How high do you estimate the beanstalk may have been? How can you check the height of the clouds to compare your estimate? How long do you think it would take you to climb this beanstalk?

Have you used fairy tales in your classroom? Our readers would love to hear your experiences of exploring mathematics through stories. You can share your ideas with us at [primenumber@mav.vic.edu.au](mailto:primenumber@mav.vic.edu.au).