
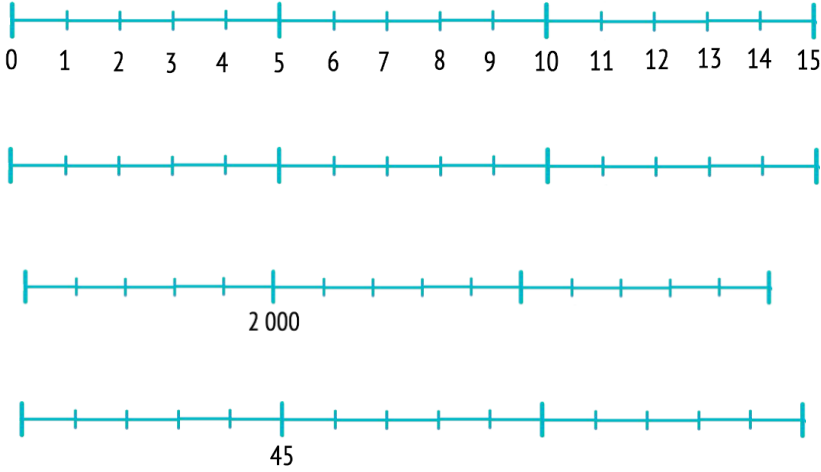


The Toad and the Hare	
<p>Problem wording</p>	<p>A hare and a toad compete to see who can jump the farthest. The toad always jumps 2 metres more than the hare.</p> <ul style="list-style-type: none"> - Can you describe the scene in your own words? - What sort of questions could you ask about it? <p>Identification of specific cases, recognition of structure and formulation of a conjecture</p> <p>1. The class as a whole analyses specific cases or examples and fills in ruled lines with the information requested. Students should be given clothes pins to represent the animals and a ruled line as in the photograph.</p> <div style="text-align: center;">  </div> <div style="margin-top: 10px;">  </div> <p>Questions:</p> <p>a) If the hare jumps 3 metres, how many metres does the toad jump? How did you find the answer?</p> <p>a) If the hare jumps 8 / 6 / 4 / 12 / 45 / 2000 metres, how many metres does the toad jump? How did you find the answer?</p> <p>Validating a conjecture</p> <p>With the class working as a whole</p>

2. The teacher draws a table with the above or new information, large enough to pin on the board for the whole class to see.

		How did you find the answer?

- How could we name the columns?
- Where would we write the number of metres the hare jumped?
- Where would we write the number of metres the toad jumped?
- What other way could we represent the distance the toad jumped without writing... [for instance, 5]?

[The teacher mentions some number listed in the table. The idea is for students to propose equivalent expressions.]

Generalising a conjecture

Suppose we don't know how far the hare jumped. It could be any number of metres.

- a) How could we represent the distance jumped?
- b) How could we figure out how far the toad jumped?
- c) If the hare jumped 'F' metres, how far did the toad jump?
- d) What does it mean to jump 'F' metres?
- e) How would you explain to a friend what they should do to find the number of metres the toad jumped?

Representing the functional relationship in a Cartesian coordinate system and interpreting the graph

With the class working as a whole

	<p>A friend used this graph [which should be large enough for the whole class to see] to represent how far the hare and the toad jumped.</p> <p>a) He says that when the hare jumped 3 metres, the toad jumped 5 metres. Do you agree? Why?</p> <p>b) How can we represent the numbers shown in the table on the graph?</p> <p>c) Is it right to place a point here [the teacher points to (6,2), (4,10)]?</p> <p>d) How would you correct the points that are wrong?</p> <p>e) If the hare jumps Z, how can we represent the distance it jumped and the distance the toad jumped?</p>
<p>Purpose</p>	<ul style="list-style-type: none"> • To establish the relationship between variables in comparisons involving addition. • To represent and analyse information in tables and bar graphs. • To analyse structural expressions representing the functional relationship. • To express the functional relationship in indeterminate/general terms.
<p>Suggestions for classroom delivery</p>	<p>If the students have never worked with tables, they may be introduced to the concept with the following exercise. The information is organised on a double entry matrix (class as a whole).</p> <p>When the table is introduced the colours and numbers are shown around the edges only. The code-coloured numbers shown in the cells should be manipulatives.</p>

V	1				5					10
G			3	4					9	
B				4		6	7			
R	1	2							8	
	1	2	3	4	5	6	7	8	9	10

The teacher may ask:

- How can we decide where to put these numbers on the table?
[Students are given the manipulatives]
- Have you thought of a way?
- What colour should the number we put here be? [The teacher points to an empty cell]

Two of the specific examples used in the task involved the numbers 45 and 2000. Even if the students have never used numbers that large, they should still be able to generalise the relationship. After they explain orally how to find the distances jumped, the teacher applies the strategy they suggest to find the numerical answer to the question.