

1. Introductory Activities

How to choose and organise the investigations inspired by this story.

I really enjoyed using these ideas and I am pleased that it has forced me to look more carefully at experimental and investigative science.

*teacher of 3-7 year olds
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INTRODUCTORY ACTIVITIES

Three of the chosen problems link with the science concept area 'forces', so initial work on forces can be carried out before the story is introduced or the investigations started.

Let the children experience a range of 'pushes' and 'pulls':

- In P.E. lessons children can be asked to balance in pairs by pulling or pushing on each other. Individually, children can push or pull on apparatus.
- Small groups of children can be challenged to move a large box across the floor, and compare the ease of pulling the box with that of pushing it.
- Compare pulling a brick tied with string on different surfaces, e.g. sandpaper, carpet, tarmac, a varnished shelf, table top, etc. Children then describe the effort required using words such as 'easy', 'quite hard', 'hard', etc. More able children may be able to use a force metre to measure the force each time.
- The brick can be put on a slope which has a material attached (sandpaper, fabric, etc.) to find out how easily the brick moves down the slope. The distance travelled by the brick can be observed and recorded (see page 12). In this way, the effect of the 'stickiness' of the surface on the ease of the brick's movement is measured.

INTRODUCING THE PROBLEMS

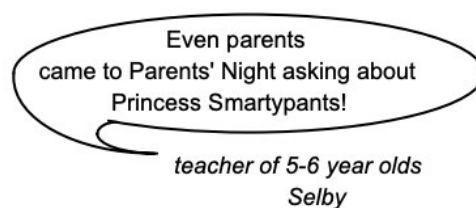
Read the story to the children up to the arrival of Prince Swashbuckle. Discuss the problems faced by the other princes in the story. Ask the children if they can think of any ways in which they could help Prince Swashbuckle solve the problems.

Note: It is best to carry out the discussions and planning the day before carrying out practical activities, to allow for preparation of resources.

Collect all the children's ideas under simple headings on the board or on a large piece of paper. For example:

<p>Slugs</p> <ul style="list-style-type: none"> ○ trap them ○ give them other food ○ slug pellets 	<p>Pets</p> <ul style="list-style-type: none"> ○ muzzle them ○ push the food in on a trolley ○ put them in a cage 	<p>Roller skates</p> <ul style="list-style-type: none"> ○ jet propelled ○ battery ○ glue princess's wheels
<p>Motorbike</p> <ul style="list-style-type: none"> ○ blindfold ○ add brakes the prince can use ○ give him a harness 	<p>Tower</p> <ul style="list-style-type: none"> ○ build a slide ○ bouncy castle ○ throw a rope 	<p>Firewood</p> <ul style="list-style-type: none"> ○ pick up twigs ○ blindfold the trees ○ play soft music
<p>Pony</p> <ul style="list-style-type: none"> ○ find a pony trainer ○ give it an apple 	<p>Shopping</p> <ul style="list-style-type: none"> ○ use a trolley ○ use a rucksack ○ lots of pockets 	<p>Ring</p> <ul style="list-style-type: none"> ○ use a fishing rod ○ use a magnet

Record all the children's ideas, even though some will not be feasible to test in the classroom. Valuing their ideas in this way encourages more children to offer suggestions in this brainstorming exercise.



FORMING QUESTIONS

Acting as the children's role model, show children how to make a statement into a question which can then be investigated. This can be done by discussing each problem in turn. For example, ask the children to describe the problem with the slugs. Children will make statements like *"They're eating all the flowers"*, and so on. Show the children how to turn the statement into a question, like:

- How can you stop slugs eating flowers?

Ask for and list possible solutions to this question. Children may come up with ideas such as trapping the slugs, giving them other food, giving them a better home, etc.

Ask if they can think of a way of turning their ideas into questions (many will still need guidance) e.g.

- Will traps stop slugs eating the flowers?
- Will giving slugs other food stop them eating the flowers?
- What sort of home would slugs like, other than a garden?

These questions can then be refined further by thinking of types of investigations that might be done in the classroom:

- How can slugs be trapped?
- What sort of food do slugs like most?
- Do slugs like the light or dark (or wet /dry) more?

In this way, children are involved in the process required to form questions to investigate.

In each of the following investigations, one question has been chosen to provide a focus. However, the children may think of other avenues to explore. Each question children pose can be discussed as to whether it could be answered in the classroom situation.

MAKING PREDICTIONS

In an investigation, ask children what they think will happen before they carry out their tests. They should also try to give a reason for their prediction, to avoid a simple guessing game and to encourage children to think more carefully about the problem. This kind of prediction can be of the 'best' or 'worst' kind, or can involve children in ranking materials according to specific properties (e.g. slippiest to stickiest). These predictions can aid children at the planning stages whilst in discussion with you or other children. Predictions are described for each investigation outlined on the following pages.