

ROBOT SHEEP DOG

To command the robot by using a variety of longer sequences.

†† Groups of three.

⌚ 30 minutes at the computer; 15 minutes demonstration/discussion.

Previous skills/knowledge needed

The children should have had experience of programming the robot and be familiar with degrees of turn.

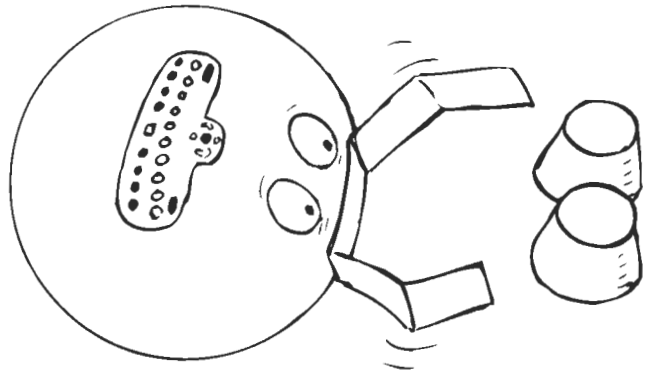
Key background information

This activity offers opportunities for an open-ended activity, with plenty of practice in estimation and collaborative working. The context is a rural one of rounding up sheep, in the guise of inverted paper cups, which have to be manipulated back into an enclosure. Paper cups make excellent objects for the robot to push along, provided that the floor surface is smooth. A small additional 'sheep catcher' made from card needs to be attached to the front of the robot, allowing it to scoop the 'sheep' and keep it trapped, even when the robot is turning round.

The object of the activity is for the children to involve themselves in entering longer sequences of commands with a challenging but amusing end goal. Again, it is important that they draw plans of their routes and record their sequences. As in the previous activities, tasks should be divided between a group of three, with one child entering the commands, the second writing the sequence and the third pacing out the intended route.

Preparation

Bend a length of stiff card into the shape shown below and tape it to the robot. The bent ends are crucial to keep the cup in place as the robot turns. Ensure that the card is stiff enough not to bend during use and that it is well taped to the robot. Lay out the paper cups as shown below.



Vocabulary

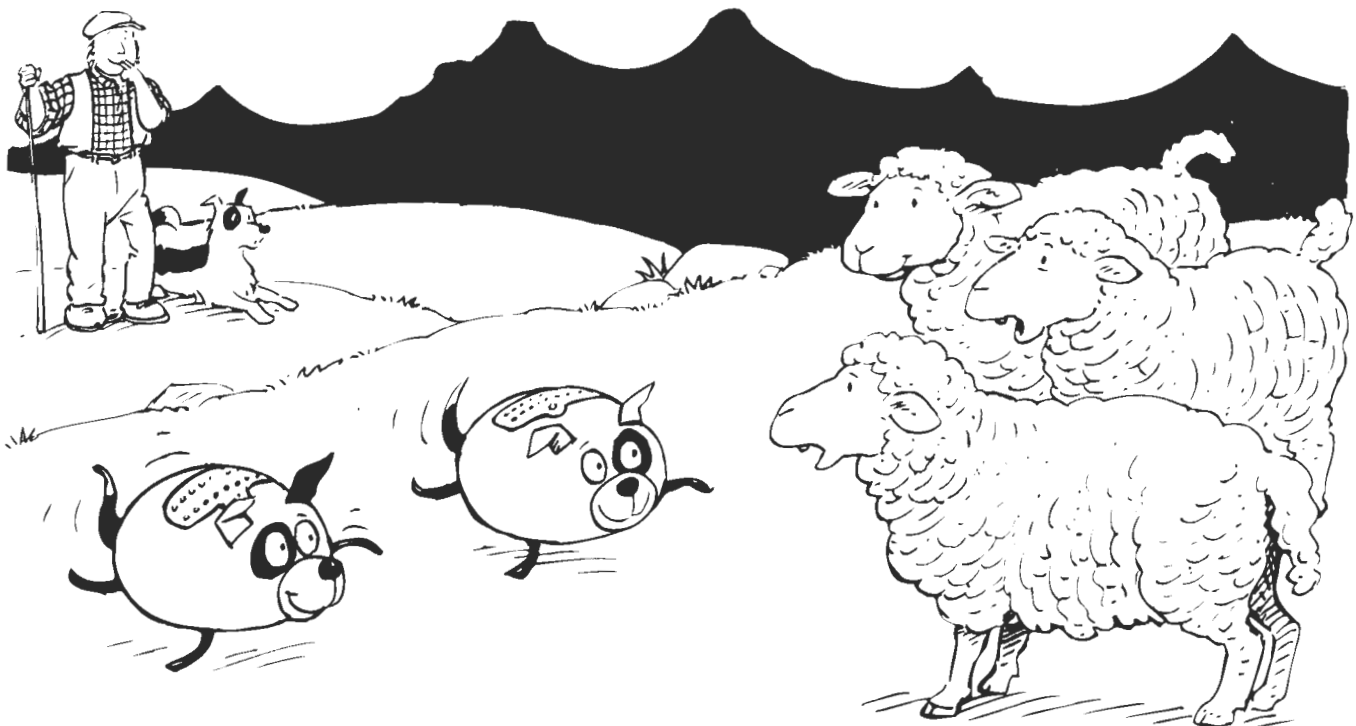
Sequence, direction, turn, route.

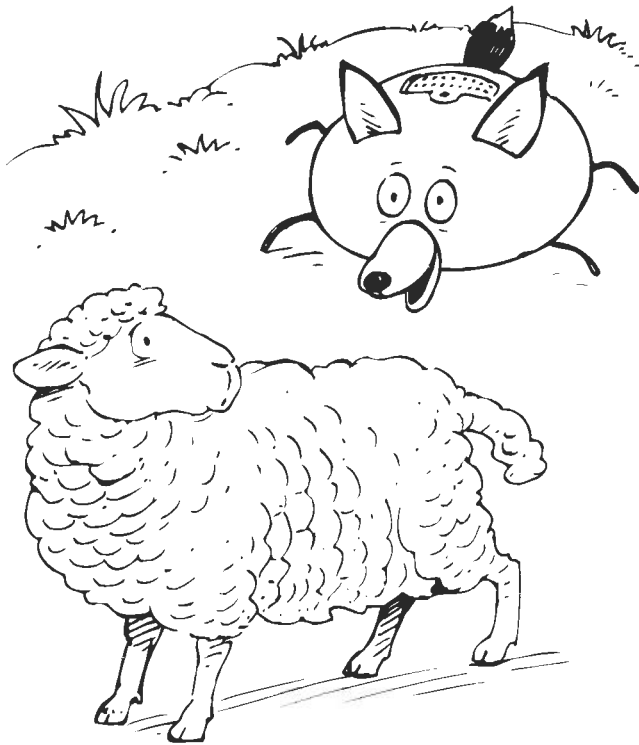
Resources needed

A computer, Logo software, a robot, paper cups, a piece of card attached to the robot with sticky tape to act as a 'sheep catcher' (see Preparation).

What to do

Introduce the children to the idea of rounding up sheep by discussing the work of sheepdogs on farms. Explain that the children are going to programme a robot to round up





various sequences, can they predict what should happen on entering a sequence of commands?

Display ideas

Create a display called 'Lost sheep', with diagrams of the 'before' and 'after' situations that the shepherd and his robot sheepdog had to cope with. Further material in the form of the children's word-processed explanations and lists of sequences, plus graphical illustrations, will all help to enhance the display.

PATTERN REPEATED

To create a procedure that will draw a specified design.

†† Groups of three.

⌚ 30 minutes at the computer; 15 minutes discussion/demonstration time.

'sheep' in the form of paper cups (laid out as shown in the Preparation section). Demonstrate how the 'sheep catcher' on the robot works by showing how it can be used to scoop up the paper cup 'sheep'.

Following the demonstration, allow small groups of children to place the robot within the 'field' and devise a sequence to make it go through the gate (two inverted cups), out into another field to round up a sheep which it then returns to the first field. The basic situation can have many variations and the children may wish to invent their own. If you have two robots, then it is possible to swap over 'sheep' by making the first robot back off and leave a sheep while the second robot approaches and scoops it up.

Suggestion(s) for extension

Once again, the complexity of the task needs to reflect the capability of the group. More confident children will be able to construct a complex scenario, perhaps gathering several 'sheep' within a set time whilst a marauding robot, disguised as a fox, runs across the path and randomly snatches a sheep!

Suggestion(s) for support

The less confident children should be given tasks appropriate to their abilities such as working with a single 'sheep'.

Assessment opportunities

This activity will allow you to assess how well the children create, test and modify more complex sequences of robot commands. Look out for clear thinking with respect to their

Previous skills/knowledge needed

The children should be familiar with programming a robot. It would also be helpful if they had experience in the use of procedures (see 'Squares all over' activity on page 90). In this activity, it is presumed that the children have access to a Roamer.

Key background information

The 'Squares all over' activity incorporated the use of a procedure. A procedure is a list of commands which is given a name. This list can be saved and then retrieved at any time merely by entering its name. This is an effective use of programming power as the list need only be written once but can be used as many times as necessary. A procedure may contain a short or long sequence of commands. The Roamer robot has a useful facility for procedure building. The procedures are given names: P1, P2, P3, up to P99, which is the Roamer robot's maximum limit.

Some exciting patterns or designs can be drawn by entering these procedures into the Roamer, with relatively few commands needed. Such designs may appear complicated, yet they are produced through the repetition of a simple pattern. As in different versions of Logo, the entering and naming of a procedure into the Roamer has its own routine, and this is outlined below.

Preparation

Make sure that the children have a smooth, clear space in which to lay out the card or paper for the robot pattern drawing activity.

Vocabulary

REPEAT, procedure, repetition, rate of turn, degree, repeat pattern.