KS1/Y2 Plan Session 1 – Quarter Turns V 90 degree turns

Class Activities

ICT — To understand and be able to use directional instructions.
To understand and use the terms left and right. To understand movements and changes in direction.
Expect the following:

- a natural, age-appropriate confusion of right and left amongst the youngest children
- a confusion of right and left when Roamer faces the starting point or when the child is doing the programming

At this stage the children should be less reliant on the teacher but will still need guiding towards understanding. Ask probing questions which prompt them to think for themselves. The important thing is that they try not that they are always correct. Make sure they have plenty of 'thinking time' and time for discussing responses to questions. Lots of praise for those who give thoughtful answers helps – even when the answers are incorrect or off target!

Resources: (click on hyperlinks)

- **PE** It is useful to teach and consolidate the understanding of (quarter) turns during PE so the children can physically experience the movement and link the language required to program Roamer to carry out these movements. For ideas of sequences which include left and right turns, see the plan and video on the Val Sabin Web site http://www.valsabinpublications.com/activate/lessons.htm **(Activate 9) (5A) CIRCUIT PATTERNS – "jogging"**
  It might be possible (if there is no IWB in the hall) to clear the classroom and children can follow the video clip sequence on the class IWB using the turn commands 'left one' 'right one'.
- **Foot/handprints on the wall** see (16) Year 1 Plan Session 1 - Investigating Left and Right
- **Left Right Man** made from: (17) Year 1 Sheet 1 – Make a little left right man resource to help children establish left and right whichever way they (or Roamer) are facing.
- **PowerPoint Presentation B** - labelling Roamer's Control Panel (left and right turns)
- **Roamer Key Symbols** downloaded from Valiant Technology http://www.valiant-technology.com/freebies/free8.htm (CM symbols (x2) - turn key symbols – all number symbols – GO symbol)
- **Paper outline of Roamer** (draw round Roamer, add a blob to stick out from the edge to represent the nose and cut out)

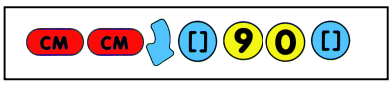
Recap see (22) Reception/Y1 Plan Session 1 – Roamer's Turn Keys. Remind the children of the function of the left and right turn keys. Power Point Slide Show B.

Turning a quarter turn –

- Ask the children if they can remember what is meant by a quarter turn. Praise their attempts to explain or demonstrate.
- Can one child (X) show you what a quarter turn looks like by shuffling round on the spot or by jumping? Point out that to begin with 'X' was facing ___ and when 'X' completed the quarter turn 'X' was facing ___
- Do the children know **which way** 'X' turned? Was it left or right? Ask 'X' to repeat the move **before** the children answer.
- Choose another child and ask them to stand facing in a different direction. Ask the children to point to where they think the child will be facing when he/she completes a quarter turn to the left (or right)
- Can the children use Roamer command language to describe what this child did? (eg left one – prompt correct response by asking which way? How far/much?
- Hold up the paper outline of Roamer with the 'nose' pointing to the ceiling and ask the children to point to show you where they think Roamer's nose will be when it/he has turned a quarter turn to the left (or right) Turn the outline slowly through one quarter turn. Children put their thumbs up if they were right (saves shouting out)
- Repeat this starting with the nose pointing down to the floor.

If the children have been learning about halves and quarters in numeracy this can be linked.
The paper outline can be folded into quarters to help explain what a quarter (and a half) is.
A clock face with moving hands is also useful. Both hands can start at 12 and the 'big' hand can be moved slowly to the quarter past position to show 'one quarter' ie the hand has moved one quarter of the way round the clock just like Roamer moves when it does a quarter turn ie it moves a quarter of the way round the circle.
Where will the big hand be after 2 quarter turns? Ask the children to point to where they think it will be before slowly turning the hand and counting the quarter turns.
Do they recognise that 2 quarter turns are the same as a half turn and that 4 quarter turns takes Roamer the whole way round?

Children sitting in a circle with Roamer in the centre -
Switch on and key in the 'secret' instructions to make Roamer turn left one or right one (see opposite)



Ask the children:

- How do we instruct/tell Roamer to make a 'one quarter' turn? What are the words we need to say so that we know which keys to press? (left one or right one)
- What do we do first? (cancel memory) Why?

Record the sequence on an easel as the children press the keys. (see opposite – right 1) Make sure they stand so that when they look at Roamer's keys the keys are the right way up! They may need to refer to their 'little man' to help with left & right.
Do they want Roamer to turn left or right?
Tell the children that now they've told Roamer **which direction** to move in, they have to tell it **what kind of turn** to do. Which key will they press to do that? (1)
Continue until the children have completed the sequence and seen Roamer complete a quarter turn.
Draw the children's attention to the sequence on the easel. (see above left) NOW SWITCH OFF ROAMER.

Another way to make Roamer turn:
Tell the children that you (teacher) don't have to give Roamer your secret instructions to make it do a quarter turn there is another way that they can try for themselves. They can decide which they think will be easier. (It is interesting for the children to experiment but they **do not** need to understand the concept of degrees at this stage)
The children will be introduced to the idea that one quarter turn is the same as turning 90 degrees but the points to establish when using this method are:

- That small numbers, 1-9, don't show much, if any, of a turn.
- They need to try bigger numbers.

Tell the children that Roamer is going to stay in the same place on the carpet but is going to turn on the spot. They will need to switch Roamer on, clear Roamer's memory, choose a turn key to press so Roamer knows **which way** to turn THEN choose a number to press to tell Roamer **how much** to turn.

Suggest that they try number 1 to begin with.

Children key in the instructions including pressing the number 1 key but **do not press GO** (yet!)
What do they think will happen when you press GO? **Tell the children they must watch very carefully because if they blink they will miss it! Press GO.** Roamer will in fact turn 1 degree.
What did (or didn't) they notice?

Tell the children that just as they can measure the length of something that is not very long by using centimetres (or, if the children are younger, by using non standard measures such as cubes) they can measure how far Roamer turns by using degrees (not to be confused with temperature measurement!)

Roamer has just turned 1 degree. Show them how it is written (1°) and point out that 1° is not very much which is why they might have missed it! Show them once more how much a 1° turn is.

Ask:

- How could they make Roamer turn all the way round so that it finishes in the same position as it started ie facing the same way?
- What do they think they should do? (use larger numbers)
- Ask the children for suggestions and let them try out their ideas. If they continue suggesting very small numbers prompt them to suggest whole tens numbers (20, 50, 70, 90 100 etc) Count in tens to 100 to remind them of the tens numbers. Write their 'try' numbers on the board but limit their tries so that they sustain interest.

If anyone suggests trying 90, some of them should notice that Roamer does a quarter turn. There may be some very bright children who will attempt to use this information to work out what the number should be to turn Roamer full circle. (I once had a very bright child in Year 1 who noticed that a turn of 90 degrees was like a quarter turn and using his considerable knowledge of quarters and halves worked out that it would be 90+90 to go halfway - "that makes 180 because 9+9 makes 18 and you have to put a '0' on the end" and "then it needs to go another half so …" He couldn't quite do the rest of the calculation but had had a very good idea of the process. That was exceptional but if you are working with year 1 and think there is a very bright child in your year one class, you could try it)
If no one suggests 90 it would be a good idea to prompt a child to do so!

Having used up several of the tens numbers to 100 can they suggest even bigger numbers so that Roamer can turn a full circle? (200, 300, 400, 500) If this is going on too long suggest that they try 300. They should notice that this leaves Roamer almost back to the where it started. Judge whether to ask for more suggestions or to tell them that to make Roamer turn a full circle they will need to tell it to turn 360° (right or left 360)

Ending the session
What have they learned about turning? Quarter turns? Half turns?
Giving instructions?
Turning without the secret instructions (1°) compared to turning with the secret instructions (1 quarter turn)?
Using big numbers etc. Can they tell you a number that was too small and a number that was too big?

If they want Roamer to do a quarter turn is it easier to remember left or right 90? Or is it easier to remember left or right 1 when Roamer has the secret instructions? The children could show their answer to each of these questions by thumbs up for yes & thumbs down for no. Can they explain their preference?

Can they remember the sequence for turning using a quarter turn? left or right 1
Can they remember the sequence for turning using degrees? left or right 90

Follow up work in class:
The children can work with Roamer in groups to consolidate these ideas.

Also - half and quarter turns – see section under the link to this page on the website where there are worksheets and slideshows that can be used.

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