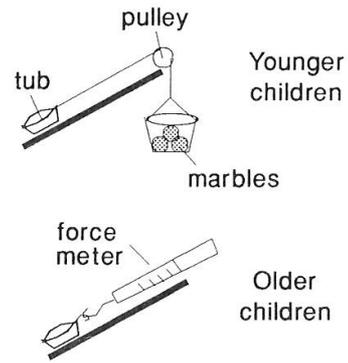## Progression in explaining results

All these children are talking about an investigation where they are changing the angle of a slope and seeing how many marbles/how much force is needed to pull a loaded margarine tub up the ramp
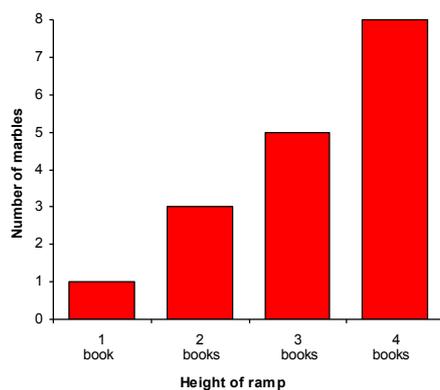

pulley
tub
Younger children
marbles

force meter
Older children

KS1

> We needed more marbles to pull it up when it was a steep slope. I thought we would.

This child said what happened and has related it back to his original prediction.

> My prediction was right because when it was flat we only needed a few marbles to make it go but we needed lots more when it was a steep slope. I think that when the slope was step it needed more pull to make it go up the ramp

This child has described what happened and has related it back to his prediction. He has also given a simple explanation of his results
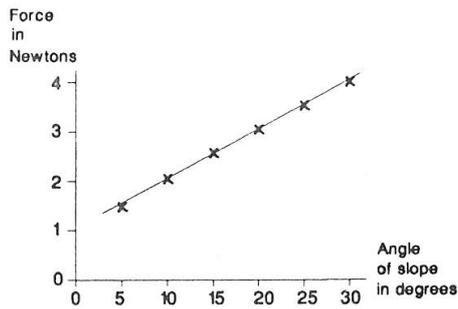
KS2

> The columns on my bar chart go up in steps. This tells me that as the ramp gets steeper you need more marbles in the bucket to make it move.

I think that more weight in the bucket gives a bigger pull force, which you need when the ramp is steeper. We thought we were going to need 2 more marbles for each extra book but we needed 3 more marbles on the last one.

This child has described a pattern on the bar chart.
By talking about the steps he has explained how more weight gives a bigger pull force and so is using his knowledge and understanding to make sense of the results

Force in Newtons / Angle of slope in degrees

My line graph goes up to the right in a fairly straight line. This means that as the angle of the slope gets more, so you need more force to make the tub move. I think that happens because when the ramp is steeper the weight of the tub pulls down more and the ramp doesn't hold it up as much. The force pulling up the ramp must be more than the force pulling down to make it move

This child has described the pattern in the line graph and the relationship between the independent variable and dependent variable. He also linked his results to his knowledge that forces can act in different directions