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## The longest side

We are learning some of the important properties of triangles

### Equipment

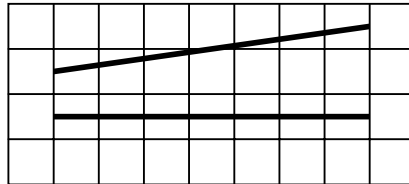
Trundle wheels, protractor, ruler, straws of varying length

### Prior knowledge:

- Use of a protractor and ruler.
- Angle sum of triangle is  $180^\circ$ .

### Diagnostic snapshot

Put up the following question and ask students to write down “which line is longest”, and “how do you know?”. Collect these responses for marking.



Students who correctly answer this question and can explain why the top line is longer do not need to work on this activity and need to be extended.

### Using Materials

Go out to the closest sports field. Students are to work in pairs or small independent groups on the worksheet. (If several groups are operating at the same time, start each at a different corner of the field). Once finished, students return to the classroom, to complete the worksheet. In groups, students should then discuss what they have learned and prepare a report for the class.

### Using Imaging/Working With Representations

Once the practical has been completed, draw a similar right-angled triangle on the board, and ask “which is the longest side of this triangle?” and “why?” If student responses are confused, make a right angled triangle out of straws on the overhead projector, remove the short side and rotate the hypotenuse until it lies alongside the other side. This should clearly show that the “angled line” is the longest.

Draw another triangle on the board, not necessarily right-angled. Again ask “which side is longest” and “how do you know?” Discuss strategies for working out the answer – especially if you have no ruler. Move on to looking at sides and angles. Ask students to look at each side, and the angle opposite this. Ask “what can you tell me about the size of an angle and the length of the side opposite the angle.” Students can investigate this for themselves on a number of self-drawn triangles, and report back their findings. Develop the concept that the longest side is opposite the largest angle (and the shortest opposite the shortest side). Introduce the special case of the right angled triangle and the hypotenuse.

Next move on to the concept that any two sides of a triangle must be longer than the side they stand against. Ask “are the other two sides of the triangle combined always going to be longer than the longest side?” and “if so, why and can you prove that they will always be longer?” Students should again work in groups to answer these questions and be encouraged to demonstrate how they “prove” the opposing sides must be longer. Establish this works when comparing each of the 3 sides of the triangle.

### **Using Number Properties**

Students use their (newly acquired) geometric knowledge of triangles to identify longest sides and largest angles, practising their language of opposite and hypotenuse as appropriate. Close by asking why the longest side in a right angled triangle is always opposite the right angle. If this is answered easily, set the challenge to further investigate sides being longer than the side they stand against. Ask “how much longer do the sides need to be?” and “are there any rules about this?” This can be worked on as practice and as homework.