

# Plato's protractor™ II

For years 9-12 Making a quip protractor

Measuring the length of arc cut off by a quip sized angle.



What's a quip?

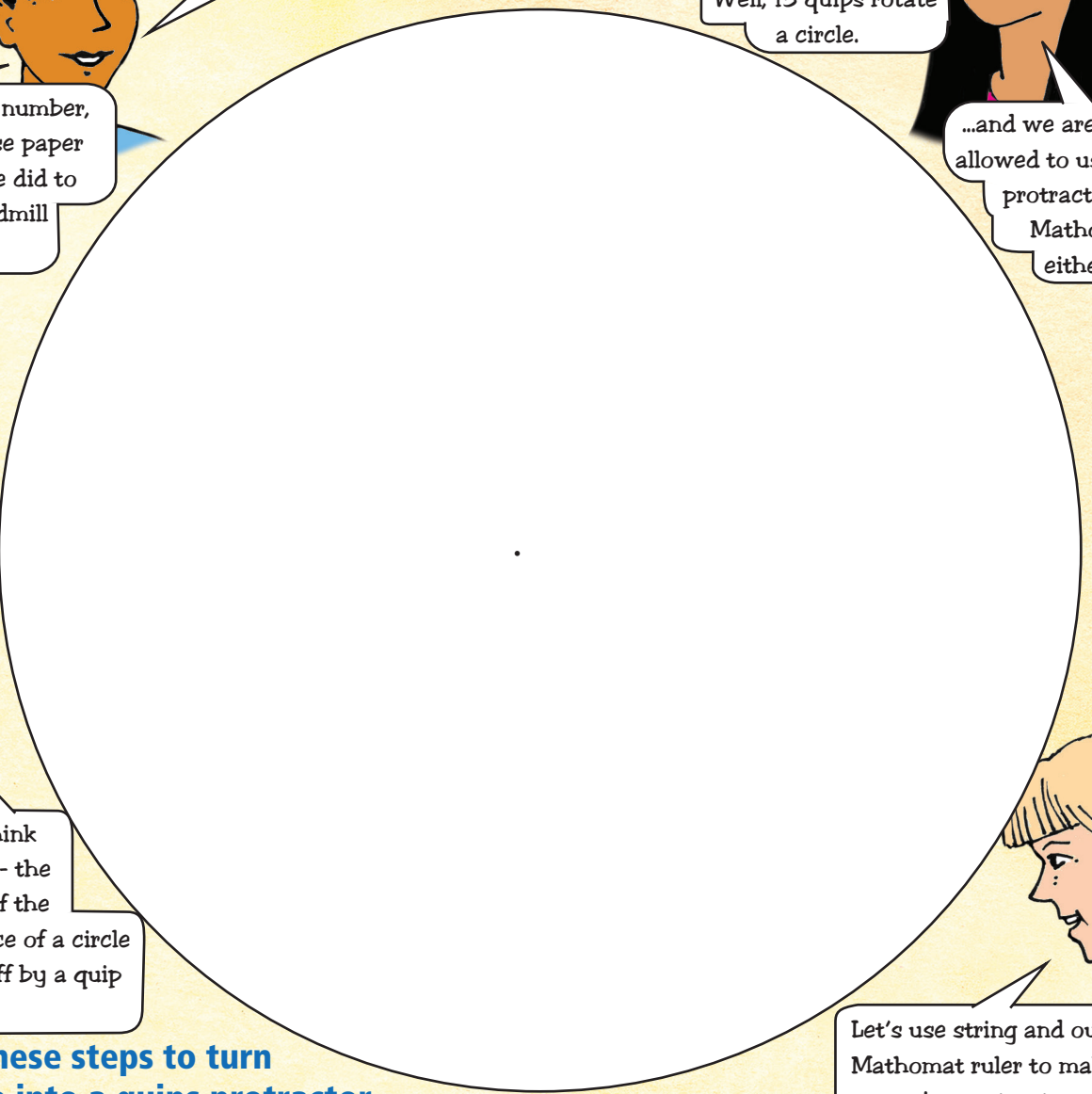
Let's make a quip protractor.



Well, 15 quips rotate a circle.

That's an odd number, so we can't use paper folding like we did to make the windmill protractor...

...and we are not allowed to use the protractor in Mathomat either.



It helps to think of openness - the proportion of the circumference of a circle that is cut off by a quip sized angle.



Let's use string and our Mathomat ruler to make our quips protractor.

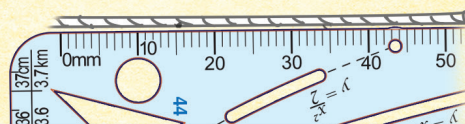
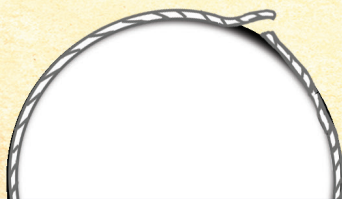
## Follow these steps to turn the circle into a quips protractor

**Step 1.** Use a piece of string to measure the circumference. Cut string off to correct size.

**Step 2.** Using Mathomat divide your string into 15, and cut off a single piece that is  $\frac{1}{15}$  th of the total, or mark your entire string into 15 equal amounts.

**Step 3.** Use your string to mark 15 equal spaces along the circumference of the circle.

**Step 4.** Rule up your quip protractor using Mathomat.



### Complete this table

Arc length cut off by a quip sized angle	<input type="text" value=""/>	mm	Circumference of protractor	<input type="text" value=""/>	mm
Ratio of arc length to circumference (openness) of a quip sized angle: ratio	<input type="text" value=""/>	= percentage	<input type="text" value=""/>	%	

More about MATHOMAT: Radians