Introducing Trigonometry
Teacher Notes

Introduction

The aim of this activity is to allow students to discover the connections between the sides and the angles of right-angled triangles and to create their own questions to answer.

Resources

There is a TI-Nspire document entitled TrigIntro.tns.

Skills required

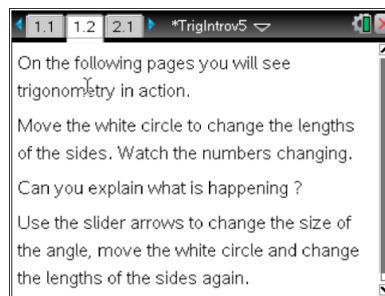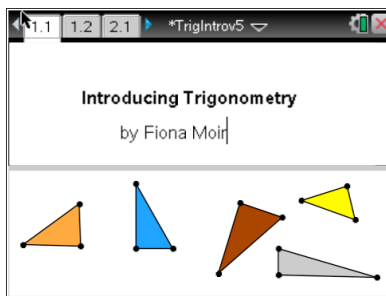Pupils should…
- Be able to move between pages of a .tns file.
- Be familiar with using menu options.
- Be able to grab and move points.
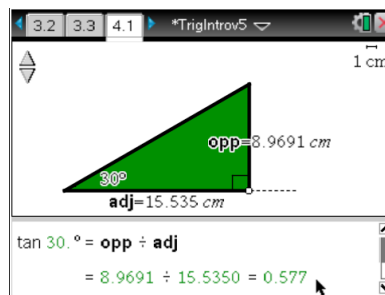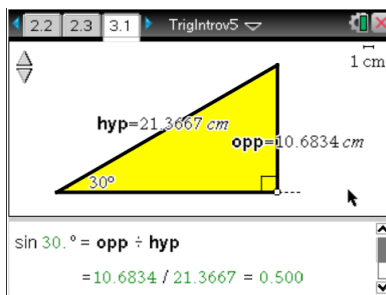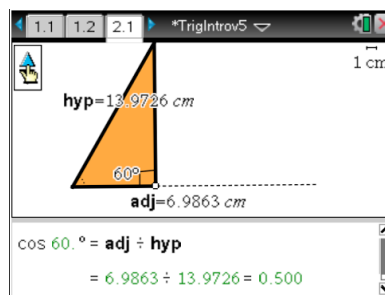- Use the scratchpad to calculate.
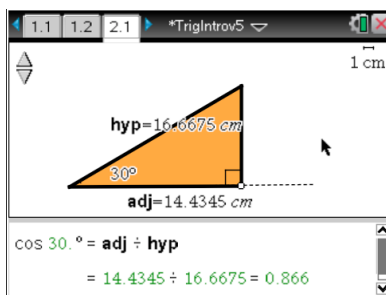- Be familiar with using a slider.
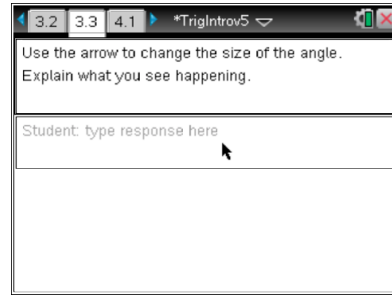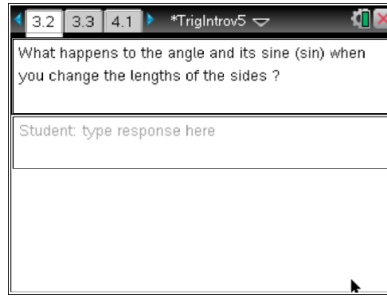
The activity

Students need to download and open the tns file.
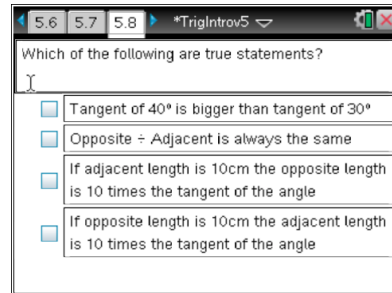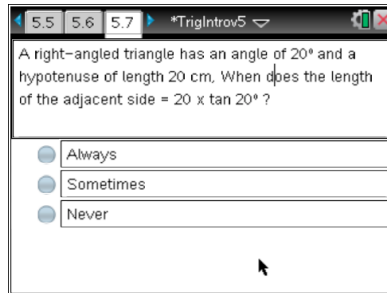
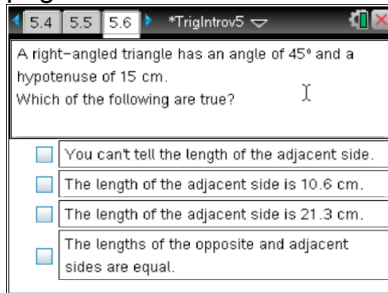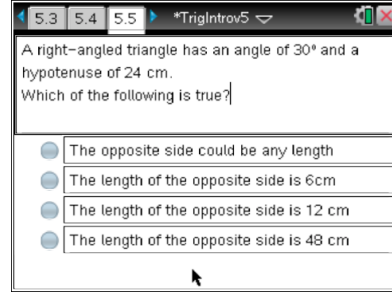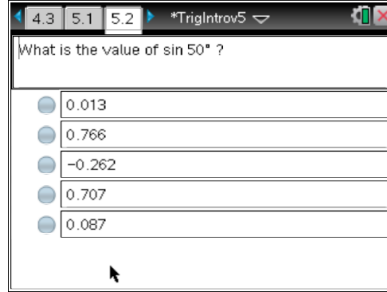The document starts with a page of instructions.

Students can grab and move the small white circle and note what happens to the values shown.
They then change the size of the angle and repeat the process.

For each of the three problems they are asked to explain what they have found in the two notes pages within each problem.

| 3.2 | 3.3 | 4.1 ▶ *TrigIntrov5 ▽

What happens to the angle and its sine (sin) when you change the lengths of the sides ?

Student: type response here

| 3.2 | 3.3 | 4.1 ▶ *TrigIntrov5 ▽

Use the arrow to change the size of the angle. Explain what you see happening.

Student: type response here

Problem 5 poses several multiple choice questions. Students are asked for the values of sin 50°, cos 20°and tan 80° together with the more searching questions shown here

They may use the diagrams from the previous problems, the scratchpad or a calculator page.

| 4.3 | 5.1 | 5.2 ▶ *TrigIntrov5 ▽

What is the value of sin 50° ?

- 0.013
- 0.766
- −0.262
- 0.707
- 0.087

| 5.3 | 5.4 | 5.5 ▶ *TrigIntrov5 ▽

A right-angled triangle has an angle of 30° and a hypotenuse of 24 cm.
Which of the following is true?

- The opposite side could be any length
- The length of the opposite side is 6cm
- The length of the opposite side is 12 cm
- The length of the opposite side is 48 cm

| 5.4 | 5.5 | 5.6 ▶ *TrigIntrov5 ▽

A right-angled triangle has an angle of 45° and a hypotenuse of 15 cm.
Which of the following are true?

- You can't tell the length of the adjacent side.
- The length of the adjacent side is 10.6 cm.
- The length of the adjacent side is 21.3 cm.
- The lengths of the opposite and adjacent sides are equal.

| 5.5 | 5.6 | 5.7 ▶ *TrigIntrov5 ▽

A right-angled triangle has an angle of 20° and a hypotenuse of length 20 cm, When does the length of the adjacent side = 20 x tan 20° ?

- Always
- Sometimes
- Never

| 5.6 | 5.7 | 5.8 ▶ *TrigIntrov5 ▽

Which of the following are true statements?

- Tangent of 40° is bigger than tangent of 30°
- Opposite ÷ Adjacent is always the same
- If adjacent length is 10cm the opposite length is 10 times the tangent of the angle
- If opposite length is 10cm the adjacent length is 10 times the tangent of the angle

Problem 6 asks pupils to work with a partner and create their own triangles. They will need to use the Measurement menu to measure lengths and angles of the triangles they create.

They could then make up some trigonometrical questions for their partner to answer.

| 5.7 | 5.8 | 6.1 ▶ *TrigIntrov5 ▽

With a partner change the shape of the right-angled triangle on the next page by moving A, B and C.

Measure the lengths of 2 sides of your triangle and measure one angle using your handheld. Use the scratchpad to calculate either the sine, cosine or tangent of the angle. Draw the diagram and show your working in your jotter. Repeat for lots of different

| 5.8 | 6.1 | 6.2 ▶ *TrigIntrov5 ▽