

Exploring triangle constructions with TI-Nspire™ Navigator™

Teacher – Nevil Hopley, George Watson's College, Scotland

Case Study



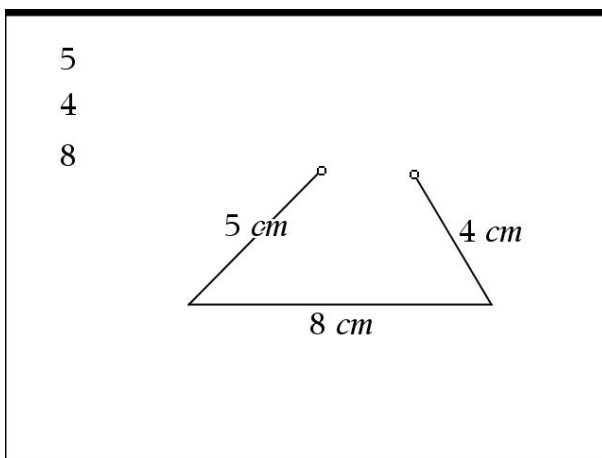
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Exploring triangle constructions with TI-Nspire™ Navigator™

Teacher	Nevil Hopley
Location	George Watson's College, Scotland
Class	11-12 year olds following the compulsory secondary mathematics curriculum
Technology	TI-Nspire™ Navigator™

Setting: George Watson's College is a mixed independent school and I have been using the TI-Nspire™ Navigator™ since October 2008 with most of my classes. In this lesson I used the Screen Capture feature.

The lesson: This lesson focused on helping the students to understand that, if it is possible to construct a triangle from three given lengths, the sum of the lengths of the two shorter sides should be greater than the length of the longest side. I used File transfer to send a pre-constructed TI-Nspire™ document to the students' handhelds. The students were then all working with a dynamic image constructed in the Graphs and Geometry application in which they could change the lengths of the three side lengths and then drag the two free vertices to try to create a closed triangle.

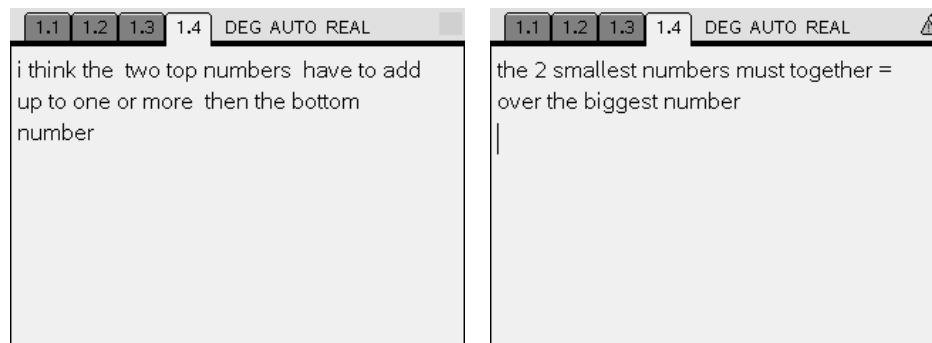


I set the students the task to drag either of the 'white dots' and see what happened. All of the students were able to form a triangle from this situation. I then asked the students to choose three different numbers between one and ten and we changed the displayed side length values to 9, 7 and 3 and explored whether it was still possible to form a triangle. We then explored 9, 7 and 2 and discussed the resulting screen.

I asked the students to try any three numbers and try to work out which sets of three numbers produce a triangle and which ones did not. Towards the end of the lesson the students were asked to add a Notes page to their TI-Nspire™ file and write their own theory about the condition that must be satisfied for a triangle to be produced.

Students' mathematical learning

The students own explorations led them to notice different features. Some students thought that the rule was to do with multiples, or with odd and even numbers whilst others were able to come up with their own correct versions of the condition.



By collecting back the students' TI-Nspire™ files I gained an insight into their emerging thinking. The students were also beginning to become mathematically inquisitive and explore negative and decimal values for the lengths of the triangles' sides.

Conclusion

Using TI-Nspire™ Navigator™ in this lesson enabled me to monitor and support the students' explorations and identify those students who needed my help to progress with the task. For example, I challenged some students who thought that the condition was related to odd and even numbers to try some particular numbers that would refute their rule.