***Activity Overview***

This activity allows students to become familiar with the idea of proofs, how they are written, and what to look for in a geometric diagram. The students will also discuss three types of proofs; the paragraph proof, the two-column proof and the flow-proof and how to use each. They will also discover the benefits and short falls of each type of proof. The students will begin the study of proofs by discussing how to prove angles congruent. They will look at vertical, complementary, supplementary and adjacent angles as well as four theorems that go along with them:

**Congruent Supplements Theorem**

If two angles are supplements of the same angle (or of congruent angles), then the two angles are congruent.

**Congruent Complements Theorem**

If two angles are complements of the same angle (or of congruent angles), then the two angles are congruent.

**Theorem**

All right angles are congruent.

**Theorem**

If two angles are congruent and supplementary, then each is a right angle.

***Teacher Preparation and Notes***

* This activity is designed to be used in a Geometry classroom.
* Students should be familiar with moving from page to page in an Nspire document as well as being able to answer different types of questions.
* This activity is intended to be part teacher lead and part student lead, with the teacher discussing the first few pages and the students then working on the last pages.
* Notes for using the TI-Nspire Navigator System are included throughout the activity. The use of the navigator system is not necessary for completion of this activity.

**Associated Materials**

* Provinganglescongruent.tnsp
* Provinganglescongruent.tns
* Student Worksheet (At the end of this file)

**Activity**:

* Open the file *ProvingAnglesCongruent.tnsp*
* Go through the first page with the students. This covers the different types of proofs.
* Hand out the student activity page (*ProvingAnglesCongruentSTU.tnsp*) and have the students fill in the information for the first two pages as you discuss it with them.
* You will also want to turn to page 3 of the teacher file and go over the theorems with them.

**Pages 1.1 to 1.5**

* Have the students answer the questions on pages 1.1 to 1.5. This will be a review of the pairs of angles.
* You can use these questions to review complementary angles, supplementary angles, vertical angles and adjacent angles. These questions can be sent from the desktop as quick poll questions and then discussed as a class.

**Pages 1.6 to 1.10**

* For pages 1.7 to 1.10 the students will need to list on their student worksheet all of the conclusions they can make from each diagram.

**Pages 2.1 to 2.2**

* On this page the students will complete a two-column proof of the vertical angles theorem. This is usually my student’s first exposure to proofs so I will walk them through the process and help them with their statements and reasons.

**Pages 2.3 and 2.4**

* The students will take the statements on page 2.3, use the diagram on page 2.4 and list all statements that can be concluded from the diagram. I will ask them to be ready to defend their choices when we discuss the answers in class.

**Pages 2.5 to 2.10**

* On these pages the students will find the value of the variable using the different kind of angles that we discussed in the beginning. They will need to show their work on the student worksheet. If you want to send these questions as quick poll questions you can. However the diagrams will not be able to be send out as these are not in the form of quick poll questions.