**How Many Seeds? Betty Darleen Horton**

***NGSS: Interdependent Relationships in Ecosystems* dhortonky@gmail.com**

***Crosscutting concepts: Structure and Function (The shape and stability of structures of natural and designed objects are related to their function.)2-LS2-2***

***Math common Core MP.4: GA 3: Model with mathematics. Recognize a lime of symmetry for a two dimensional figure.***

***Disciplinary Core Idea: PS3.D: The energy released from food was once energy from the sun that was captured by plants in the chemical process that forms plant matter.***

***Connections to Nature of Science: Science assumes consistent patterns in natural systems. 3-LS4-1***

***Science assumes that objects and events in natural systems occur in consistent patterns that are understandable through measurement and observation. MS-LS2-3***

**There are many different types of tomatoes grown in the gardens. Gardeners plant different varieties for different purposes. Each variety has its own structures in regards to the numbers of tomatoes on a plant as well as how may seeds the tomatoes might have or the way the tomato may be used. Few students of any age will have utilized tomatoes as a tool for engaging in estimating, counting and measurement activities. Along with the connections to science, math, literacy and social studies, there are excellent connections to practical living as well.**

**Grades 2 – 4**

**How many seeds are there in a cherry tomato?**

**Pre assessment: How can we find out how many seeds are in a cherry tomato?**

**Activity:**

* **Identify a place near tomato plants in the gardens where students can put their materials and do the activity. The center area around the pump could be an excellent location.**
* **Explain the activity to students: Cherry tomatoes are small and round and tasty. Ask if anyone has eaten cherry tomatoes – maybe on a salad? Ask students to share what they know about tomatoes. Hopefully someone will mention seeds. If not, share that there are seeds in the cherry tomatoes. We are going to first estimate how many seeds we think are in one tomato and then will do a science activity to find out how many there really are.**
* **Have students draw a picture of the cherry tomato their team is given. (Depending on the crop in the garden, tomatoes may have to be purchased ahead of time.)**
* **Ask students to estimate how many seeds they think will be in the tomato. Write that number by the drawing.**
* **Next, explain that they will be dissecting (cutting the tomatoes in half) with a partner. At this point, demonstrate how to use the plastic knife to cut the cherry tomato in half.**
* **Each team will remove the seeds from one half of the tomato and count them. Explain that the “jelly” around the seeds protects the seeds.**
* **Remove the seeds from one half of the tomato and count them.**
* **By either multiplying the number by two or by adding the number to itself, the number of seeds in the tomato can be found.**
* **At this point, do a think, pair and share time so that teams can compare their numbers.**
* **Points to discuss: what is symmetry? Was the tomato cut exactly in half? If so, both sides will be the same. (Many students will want to count the seeds in the other half of the tomato – this is a good way to help them understand the importance of understanding the concept of half.)**
* **Extension: Look around the garden. Find other examples of symmetry (ex: look at leaves).**
* **Post assessment: How many seeds did each team decide was in a cherry tomato? Write this number on the paper with the drawing of the tomato and the estimated number of seeds.**

**As the grade levels increase, the rigor of the activity may be increased by:**

* **Adding different sized tomatoes and doing the same activity**
* **Comparing the amount of fleshy tomato of the different kinds of tomato and discussing how the different types of tomatoes may be used. A great example is Roma tomatoes, which are most often used to make tomato sauce.**
* **Increase the detail of the drawings**
* **Estimating the amount of yield from different types of tomato plants**

**Science, Math, Art, Practical Living, Social Studies**