## Naturalist Outreach
### Lesson Plan

**Mitchell Roze Grades: 9-12  Date: 21Feb19**

**Unit/Topic/Lessons: Turtles, Turtle Shells, Geometry**

### Objectives

Student will be able to:
- Go through Scientific Process, observation to results.
- Learn how both the turtle and chicken egg take advantage of geometric strength.

### Correlation to State & National Documents

**Alabama Course of Study: Science**
- 9-12 Unity and Diversity:14
- AHSGE/Exit Standards & Eligible Content:

**National Science Standards:**
- 9-12 Life Science:
- Biological Evolution
- 9-12 Physical Science:
- Motion & Forces

**Assessment:**
- Scientific paper

### COS Content Standard

14. Analyze and interpret data to evaluate adaptations resulting from natural and artificial selection that may cause changes in populations over time (e.g., antibiotic-resistant bacteria, beak types, peppered moths, pest-resistant crops).

### Materials/Resources & Assessment

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<th>Equipment Needed</th>
<th>Instructions</th>
<th>Grouping Strategies (Small group, pairs)</th>
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<td><strong>Hands-On Materials</strong></td>
<td>Those participating in the lab will put on the plastic gloves and handle the eggs, taking care not to break them immediately. The participants will then squeeze an egg with the thumb and forefinger along one side of the egg squeezing with increasing force until the egg breaks over the box or bin. Next, the participant will squeeze along the opposite direction in the same manner until it cracks into the bin. (See Activity Sheet for discussion questions)</td>
<td>Small groups of 2-3 students are recommended for improved discussion and accountability.</td>
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<td><strong>Multimedia Materials</strong></td>
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<td><strong>Maps</strong></td>
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### Equipment needed
- Eggs
- Kitchen/plastic gloves
- Writing utensil/Paper
- Paper towels
- Cardboard box/bin

### Assignments

**Class work:**
- Scientific method

**Guided practice:**
- Guide students through testing eggs

**Reading:**
- Text/Articles/Other Papers on Turtles, Turtle Shell Structure and Shape

**Writing:**
- Write a scientific paper on experiment

**Homework:**

### Background/Preparation

Teacher should have knowledge of basic turtle biology and geometry.

Take care to emphasize the connection between the shape of an egg and turtle’s shell.

**Resources:**
- Various Research Papers and website links (See Resource Guide)

### Special

Integration with other disciplines:
- Writing (W 9-10.2), Math (Geometry),
- Engineering/Architecture
- Remediation Activities:
- Enrichment Activities/Extensions:
- Write a scientific paper on the study

### Special Topics/Schedules


### Total Duration:

Experiment from 20-40 minutes, Scientific paper can be turned at a later (Introduction, methods, results, discussion, abstract). This could be done over the course of several class periods.