

Name \_\_\_\_\_

### The Natural Selection of Stickworms

**PROCEDURE:** Today, you are all "sticky-birds", members of the species *Birdus stickus*, which, as every good biologist knows, are great connoisseurs of the common stick-worm, or *Stickit tooya* in the family Toothpickidae. These worms have a remarkable resemblance to the common toothpick in structure. But make no mistake about it, these skinny sticks of nutrition are actively sought out by all members of your species. Take a good look around you... those famished, beady-eyed birds are your competition. Yes, that's right! It's you or them!

You are a migrating bird, and today you are passing over Flammer's fertile farm on your way north for the Winter. That's right, NORTH! You're a weird bird. In the pasture, you spot the stick-worms waiting (sticking around). Lucky for you, whenever a stick-worm sees a sticky-bird, it freezes in fitful fear. This makes it very easy for you to pick it up with a minimum of effort. Although there is only one species of this worm, it is found in two color forms: tan and green (*Stickit tooya domesticus*, and *Stickit tooya chloris*, respectively).

Farmer Flammer favors these funny, frolicking stick-worms because they fill the fields with finely filled furrows which favor the flora and fauna of the fertile farm. So watch out! Gorge yourself with these delicacies, but be ready to make a hasty retreat in case farmer Flammer sees you.

When we fly out to the grassy pasture, wait along its side until a signal is given. Then start picking up stick-worms as fast as you can. You won't have much time because farmer Flammer and his friends will chase you nasty birds out of his perfect pasture. When he does, come flying back to your nest as fast as your little wings can carry you, and count your stick-worms by color.

On the work sheet provided below, record your totals and the class totals, as indicated.

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Then answer the questions.

**We are starting out with 300 Green stick worms and 300 Tan stick worms**

**Data: 1<sup>st</sup> Generation**

No. of TAN stick-worms you caught\_\_\_\_\_

Total number of Tan worms caught by class\_\_\_\_\_

(# of Tan worms still “alive” \_\_\_\_\_)

No. of GREEN stick-worms you caught\_\_\_\_\_

Total number of Green worms caught by class\_\_\_\_\_

(# of green worms still “alive” \_\_\_\_\_)

**Now, the stick worms have babies. For every stick worm still alive there is 1 baby born.**

Total # of Tan Offspring\_\_\_\_\_

Total # of Green offspring\_\_\_\_\_

**Data: 2nd Generation**

No. of TAN stick-worms you caught\_\_\_\_\_(Total TAN caught by class \_\_\_\_\_)

No. of GREEN stick-worms you caught\_\_\_\_\_(Total GREEN caught by class\_\_\_\_\_)

Total number caught by you...\_\_\_\_\_(Total worms caught by class\_\_\_\_\_)

**Questions:**

1. If the sticky-birds fed on this population of stick worms for many years, what color would most of the stick worms be?
2. A change in environment around living organisms can make natural selection occur faster.
  - A) Describe the environment of the stick-worms (from their point of view)
  - B) Describe how the environment changed during your class period (was the habitat changed, was there immigration, emigration, competition among species, changes in resources....be specific and detailed).
3. For BOTH the sticky-birds and the stick worms, explain the competition that was set up today in terms of the following:
  - A) What was each competing for?
  - B) What survival advantages did some have?
4. Why does placing a time limit on collecting the worms make this activity more realistic?
5. What would be the most likely result of this experiment if it were repeated after the lawn was dry and yellow?
6. Why did the class find different numbers of green and tan worms?
7. Define natural selection
8. How did the frequency of alleles change from the beginning of this activity to the end of this activity?

9. How can natural selection explain the adaptations we saw in the worms?
10. If evolution is defined as a change in gene frequency over time, describe how natural selection may act on the stick worms to create a mechanism of evolution.
11. Could speciation (the emergence of new species from existing species over long periods of time) of stick worms using the natural selection model? Why or why not?