

# Radioactive Licorice

## Summary

Students will use licorice to model radioactive decay of elements. Students will see how accurate dating of fossils can provide evidence for change in populations over time and evidence for evolution.

## Time Frame

1 class periods of 60 minutes each

## Group Size

Individual

## Materials

- [student worksheet](#)  
(attached)
- 3 colors of Licorice
- scissors
- graph
- triple-beam balance

## Student Prior Knowledge

Students should have a basic understanding of atomic structure.

## Instructional Procedures

Obtain 3 bags of licorice of three different colors. (The "pull and peel" licorice will stretch a lot further if you teach several different class periods)

If you wish you can cut each piece of licorice to varying lengths. This is to simulate each student starting with a different amount of each element it also makes it so students cannot copy off of one another.

Make copies of the student page and distribute to class.

Have students read through background and purpose.

Students should make predictions

Pass out licorice to students, each student should receive one piece of each color.

Allow students to complete lab.

## Answers to Analysis Questions:

1. Answers will vary.
2. Radioactive decay is where an element, which is radioactive, decays over time by emitting a small part of the atom. It becomes something new in this process. By comparing the amount of "new" and "old" element in the fossil, scientists can date fossils.
3. All graphs showed a logarithmic decline. However, elements with shorter half-lives decayed more quickly along the x axis.
4. The longer the half-life the more of the original element that remained in the sample after the same given amount of time. After 4000 years red would have a 1:1 ratio of old:new, brown would have 1:2, and black 1:3.
5. Uranium could be used to date things which are very old. A good example would be dating the age of Earth and of the age of objects in the universe.

6. 11,460 years
7. The Carbon 14 would have nearly all decayed.
8. She must show that the age of the fossils matches with her hypothesis of the evolutionary change. By using radioactive dating she can obtain the ages of the fossils and compare.

Answers to Conclusions:

Answers will vary but should include a discussion of radioactive dating and its application to evolution.

### Assessment Plan

#### Scoring Guide:

Prediction.....	1 point
Data Tables.....	1 point each (3 points)
Graph.....	10 points (this should be a line graph)
Analysis Questions.....	2 points each (18 points)
Conclusions.....	6 points
Total.....	38 points

### Bibliography

Lesson Design by Jordan School District Teachers and Staff.

### Authors

[Utah LessonPlans](#)