



# Rooster and Lily are Foiled Again!

## National Standards > Science

NS.K-4.1, NS.5-8.1

### Science as Inquiry (Grade 4) (Grades 5 & 6)

- Abilities necessary to do scientific inquiry
- Understanding scientific inquiry

## Kentucky: Science > Scientific Inquiry > Scientific Ways of Knowing and Working Standard

S-4-SI-1, S-5-SI-1, S-6-SI-1

- Identify; Ask simple scientific questions that can be answered through observations combined with scientific information.

S-4-SI-2, S-5-SI-2, S-6-SI-2

- Use appropriate equipment, tools, skills, and mathematics in scientific investigations.

S-4-SI-4, S-5-SI-4, S-6-SI-4

- Design and conduct different kinds of simple scientific investigations; to answer a variety of questions.

S-4-SI-6, S-5-SI-6, S-6-SI-6

- Review and ask questions about scientific investigations and explanations of other students.

## Ohio: Science > Science Inquiry Standard

- Develop scientific habits of mind [for] use of the processes of scientific inquiry to ask valid questions and to gather and analyze information.

### Benchmark(s)

Grades 4 & 5

- B. Organize and evaluate observations, measurements and other data to formulate inferences and conclusions.

Grade 6

- B. Analyze and interpret data from scientific investigations using appropriate mathematical skills in order to draw valid conclusions.

## Ohio: Science > Scientific Ways of Knowing Standard

- Realize that the current body of scientific knowledge must be based on evidence; be productive, logical, subject to modification and limited to the natural world.

### Benchmark(s)

Grades 4 & 5

- A. Distinguish between fact and opinion and explain how ideas and conclusions change as new knowledge is gained.
- B. Describe different types of investigations and use results and data from investigations to provide the evidence to support explanations and conclusions.

Grade 6

- C. Give examples of how thinking scientifically is helpful in daily life.

## **Observation for Information**

**A fingerprint is an impression of the pattern of lines and swirls found on the end of a person's fingertips, and serves as a personal identity code for an individual. The lines and swirls of fingerprints sometimes provide information used to help solve problems. Identification of fingerprints would perhaps help solve Annie's problem of finding her real parents.**

### **Objective**

Students will distinguish between fact and opinion and between observation and inference.

Students will demonstrate an understanding of the importance and relevance of a single example/sample.

Students will observe a grouping of fingerprints to describe patterns, infer and summarize relationships.

### **Vocabulary**

- Attributes
- Observation

### **Materials**

- 3 x 5 inch index cards divided into 1 inch columns (one per student)
- Ink pad
- Chart paper
- Magnifying glass (one per student)
- Markers, crayons, colored pencils
- Pencil, paper'
- Handout, *Fingerprint Observation*

## **Activity**

### **Teacher will:**

- Share with students and post for continued review the standards and benchmarks (expectations) for this lesson.
- Introduce the task through class discussion on the concept of a fingerprint, and a brief history its use.
- Ask students if the use of a fingerprint would have aided the search for Annie's parents, and if so, how?
- Have students brainstorm characteristics of a fingerprint.
- Have students brainstorm prior knowledge about fingerprints, list, and decide which statements are fact (F), which are opinion (O), and label statements accordingly. *This activity may require research to gather factual information about fingerprints.*
- Explain and model how to take an individual fingerprint using an ink pad and index card.
- Have students take a fingerprint of each finger on one of their hands. *Students will use an ink pad and index cards, registering one fingerprint within one of the 1 inch columns.*
- Have students (in small groups) exchange their prints with another student for close observation of the fingerprint attributes, and make general observations and inferences.

- Have students record their observation and inferences and compare to the previously brainstormed list of statements about fingerprints. *Students will learn if close observation helps to validate information about an object by confirming a factual or inferred statement.*
- Instruct student groups to look at all their fingerprints and observe any patterns found in the existing fingerprints. Ask students if categorizing fingerprints is even possible as fact states that no two are the same, and is this why fingerprints help with identification of an individual?
- Have students write conclusive summary statements of their findings and opinions.

**Performance Assessment:**

**Teacher will evaluate students' ability to:**

- Demonstrate an understanding of the difference between fact, opinion, observation and inference.
- Explain why each of the above elements of science has merit and is important.
- Follow directions and complete the task of taking fingerprints, observing, inferring and writing summary statements.



## Fingerprint Observation



**During our exploration of fingerprints, I believed that fingerprints were... (What I know) Prior Knowledge**

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**Through close observation, I came know that fingerprints... (What I Learned) Specific and detailed observations**

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**This data is acceptable proof to change my inferences into fact because fingerprints...are, can, have, etc.**

**(Write a summary statement that communicates findings of your observations.)**

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