**Cross Curricular Connections**
**Science Extensions**
**Grades 4-6**

# Fox and Grapes: Feeding Mr. Fox

***National Standards>Science> Science and Technology***
**NS.K-4.5, NS.5-8.5 (Grades 4, 5 &6)**
- Abilities of technological design.

***Kentucky: Science> Applications/Connections Standard***
**Patterns, Systems, Scale and Models, Constancy, and Change over Time**
**S-4-AC-1**
- Use science to design simple technological solutions (e.g., paper clips, stapler) to solve problems.

**S-4-AC-3, S-5-AC-2**
- Examine; demonstrate the role science plays in everyday life.

**S-6-AC-1**
- Examine the interaction between science and technology.

***Ohio: Science> Science and Technology Standard***
- Recognize that science and technology are interconnected and that using technology involves assessment of the benefits, risks and costs.
- Build scientific and technological knowledge, as well as the skill required to design and construct devices.
- Develop the processes to solve problems and understand that problems may be solved in several ways.

**Benchmark(s)**
**Grades 4 & 5**
**A.** Describe how technology affects human life.
**B.** Describe and illustrate the design process.
**Grade 6**
**B.** Design a solution or product taking into account needs and constraints (e.g., cost, time, trade-offs, properties of materials, safety, aesthetics).

## Creative Minds Solve Problems

**Solving problems requires critical thinking and analysis of a situation. Aesop wrote fables that used creativity to make a point and explain the outcome of a situation. Scientists use creativity in the design and invention of devices to add human needs and wants.**

**Objective**
Students will work in pairs to solve Mr. Fox's problem of obtaining grapes to fill his hungry stomach.
Students will design and draft a device for obtaining grapes from high places.
Students will critique and evaluate the work of their peers, make comparisons, suggestions, and ask questions.

**Vocabulary**

- Feasible construction
- Rubric
- Solution
- Restraint
- Revision
- Efficiency

**Materials**

- Fox and Grapes student handout with instructions
- Paper for illustration and written work
- Rubric rating scale page

**Activity**

**The teacher will:**

- Share with students and post for continued review the standards and benchmarks (expectations) for this lesson.
- Introduce the task by reading the introductory quote from the Aesop's Fables production. (See attached on the Fox and Grapes student handout).
- Supervise student selection of partners for completion of task.
- Hand out and review written student instructions. *Emphasize to students the importance of design for their invention. There are no restraints. Any idea, all materials and costs will be considered by Mr. Fox*
- Explain the rubric rating and categories for assessment purposes.
- Monitor progress of student partners through observation of their design drafts and written description of the invention created through problem solving.
- Review with students the rubric scale and ratings, and oversee student peer review of student designs.
- Distribute and facilitate discussion of extension questions

**Students will:**

- Select a partner for the task.
- Follow guidelines on student handout to design, describe and draft a solution for Mr. Fox's assistance.
- Use the rubric scale for peer review and to rate each team's design.
- Compare designs and share comments with the class during discussion
- Tally rubric ratings to determine a design choice to assist Mr. Fox.
- Complete the handout extension questions and share ideas.
    - Will the selected design of invention cause any additional problems for Mr. Fox?
    - What revisions do you fine necessary to improve the chosen design and why?
    - What is needed for design alterations if restraints were added to the design (e.g., cost, limited resources, limited timeframe, limited usage, etc.)?

**Performance Assessment**

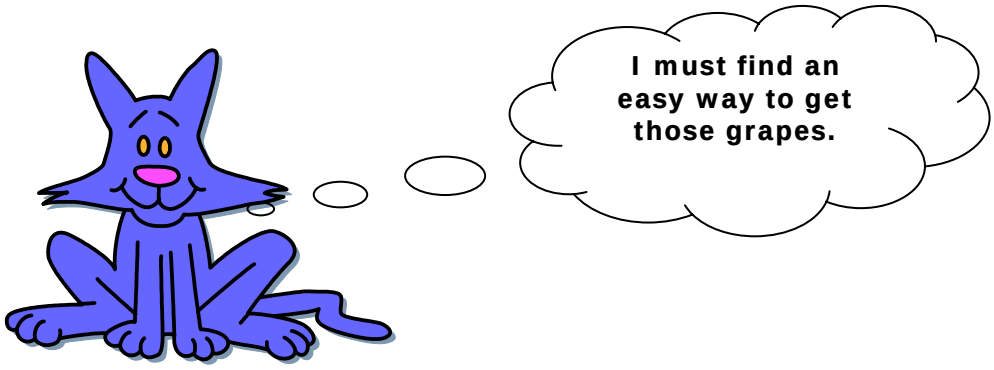
**Teacher will evaluate students' ability to:**

- Follow directions.
- Create, design and draft a technological device.
- Demonstrate an understanding for science and technology in the critique of needs assessment.

# Fox and Grapes

**"Mr. Fox, on a hot summer day, was in search of something to eat.
His stomach was empty it started to hurt, so did the soles of his feet."**
*Aesop's Fables*

*Mr. Fox was very hungry and lazy. He did not see a need to work hard to achieve goals. One day, as he was walking along with the front of his stomach touching his backbone, a juicy grape plummeted from a vine high above him. When the grape splattered between his ears (like a cicada hitting the windshield of a car) and moistening his fluffy fur, an idea seeped into his head.*




***Enter stage left…..You and Your Partner!***

**Working together, you will help Mr. Fox find a solution to his problem! He needs a device or "invention" to assist him in easily "getting those grapes".**

**Mr. Fox is very cunning. He has many design teams working on this problem and will only select the best device/invention to purchase and put to use. Your goal is to design the most creative solution, using feasible construction materials and methods. Keep in mind that the device you design must be very easy to use and very efficient.**

**Directions:**

- Design a solution to Mr. Fox's problem keeping in mind Mr. Fox's physical and personal characteristics.
- Draft, illustrate and label your designed device/invention.
- Write a complete description of your device/invention including:
    - A creative name for your design
    - A listing of construction materials
    - Steps for construction
    - Explanation on how your device works, and what Mr. Fox will need to do to use it.
- Display your design for your peers to review and rate using the rubric rating scale.
- Evaluate the design of your peers using the rubric rating scale.
- Answer extension questions about the selected design.

Aesop's Fables
**Handout: Student Use Rubric Rating Scale**

| **Rating Category** | **1 Super Sweet Grapes**<br>The best. The ones "to die for."<br>Number one grade. The top of the line. | **2 Regular Grapes**<br>The ordinary ones, the common ones.<br>Those that are, Ok.<br>Found just about anywhere. | **3 Sour Grapes**<br>The ones with problems.<br>Not developed enough. |
|---|---|---|---|
| Creative Design | • Authentic and unique; grabs your attention immediately<br>• Explicit drafting and labeling of parts<br>• Concise written description of design | • Average; I have seen this before<br>• Visible missing parts in draft and labeling of parts<br>• Clear description of design | • Incomplete draft and no labeling of parts<br>• Written description is unclear and difficult to understand |
| Feasible Construction | • Structurally strong and secure<br>• Selected materials appropriate for design | • Somewhat strong and secure<br>• Selected materials are somewhat appropriate for design | • Lacks structure and strength<br>• Inappropriate selection of materials |
| Ease of Use | • Steps are easy to follow; easy enough to supply grapes for an entire winery without much work | • Most steps are easy to follow; easy enough to supply grapes for an average fox's needs | • Steps are confusing to follow; easy enough to supply grapes for only a small snack or bite |
| Efficiency | • Works on first try; no waste or breakdowns<br>• Little amount of energy exerted during use | • Minimum waste and breakdown<br>• Average amount of energy exerted during use | • Difficult to use; gets basically nothing for the effort<br>• Large amount of energy exerted during |

**Rate each team's design based upon this rubric.**
**The goal is for a team to earn as many #1's as possible.**