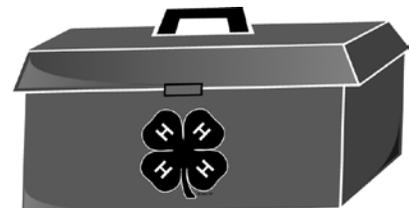


2

"Independence through Projects" Lesson Plan





Learning Objectives

1. Identify resources to share with 4-H Club members.
2. Describe key components of the Science, Engineering, & Technology (SET) National 4-H Mission Mandate.
3. Identify age-appropriate activities related to SET.
4. Define additional terms related to SET.
5. Explore the Experiential Learning Model.

Intended Audience

Adult 4-H Volunteers



Supplies & Resources Needed

- Lesson plan with instructional objectives
- Notes pages of PowerPoint presentation with talking points
- LCD projector and laptop with PowerPoint presentation loaded
- Copies of PowerPoint slides printed as a three-slides/page handout for each participant
- Copies of each mini lesson described (2a-2h)
- Copies of lesson plan quiz for each participant
- Pencils or pens for volunteers to take notes and complete the quiz
- Copies of "Independence through Projects" fact sheet



References

Carrell, Tony. (2008). *Experiential Learning Model*. Presented at 4-H Youth Development Master Volunteer Training. West Lafayette, IN.

National 4-H Council. *Mission Mandates*. Retrieved December 12, 2008, from <http://www.fourhcouncil.edu/missionmandates.aspx>

Pfeiffer, J.W., & Jones, J.E. (1983). *Reference Guide to Handbooks and Annuals*. John Wiley & Sons, Inc.

Silliman, B. (2007). *Critical Indicators of Youth Development Outcomes for 4-H National Mission Mandates*. North Carolina State University.

Projected Length

20-25 minutes



Introduction



Information found on Slides #1-2.



“Independence through Projects” is the overall title of this lesson. Our goal with this lesson is to provide Adult 4-H Volunteers with a number of hands-on activities that can be shared with 4-H members, likely in a club setting. The activities have been taken from existing 4-H curriculum materials that are available to all of us.

We also hope to show members how they can learn to become more independent through the projects they complete in 4-H. Whether it’s learning the proper way to signal when riding a bicycle, choosing products with the best value at the grocery, or learning how science plays a role in our everyday lives, 4-H projects provide members with a number of skills that they can use throughout their lives. These life skills play an extremely important role in the development of each 4-H member. So, while they are having fun completing their 4-H projects, they are also learning important skills.

Objective 1

Identify resources to share with 4-H Club members.



Information found on Slides #3-7.



Let’s take a look at the activity lesson plans that are included in this lesson.

2a: Bike Safety and Rules – 4-H Bicycle Project (Level 1)

This lesson includes a description of how to make appropriate hand signals when bicycling and a review of other bicycle safety rules.

2b: Make Your Own Play Dough – 4-H Child Development Project (Level B)

This lesson discusses the use of play dough to help young children develop eye/hand coordination and encourages observation of children’s reactions when they play. A recipe for homemade play dough is included.

2c: Foam Test – 4-H Consumer Clothing (Intermediate)

Members will learn about active ingredients included in shampoos and toothpastes as they test different products to see which are the most economical.

2d: Dots Before My Eyes – 4-H Entomology (Level 2)

This lesson helps members understand how insects use bright colors and camouflage to survive.



2e: Make a Volcano – 4-H Geology (Level 1)

Members will learn how volcanoes erupt and form rocks. A recipe is included for members to create their own mini volcanic eruption.

2f: How to Build a Rain Gauge – 4-H Weather (Level 1)

This lesson shares information on parts of weather, the importance of water, and how to measure rain. Instructions are included for members to build a basic rain gauge.

2g: Texture Feely Bags – 4-H Soil & Water Conservation (Level A)

Members will use only their sense of touch to identify a number of products and relate this experience to identifying the texture of the three basic soil types.

2h: My Personality – 4-H Personality (Level A)

In this lesson, members will learn about characteristics that make their personalities special and unique. They will identify things they can do to be responsible at home and in their communities. Instructions for completing a basic personality project poster are included.

Objective 2

Describe key components of the Science, Engineering & Technology National 4-H Mission Mandate.



Information found on Slides #8-12.



As you might have noticed as we reviewed the lesson plans, a number of these activities help members learn about science and related fields. One of the exciting National 4-H Mission Mandates is Science, Engineering, and Technology (SET). Thus, this is a second purpose for providing this lesson plan to Adult 4-H Volunteers. It's natural for the 4-H program to have the SET initiative, because we already do so much in these areas. Having SET as a National Mission Mandate encourages us to be more intentional about how we teach these areas to our 4-H members. Let's take a look at some of the components of 4-H SET.

4-H Set: One Million New Scientists. One Million New Ideas.™

These are the tag line, logo, and goal of the National 4-H SET Mission Mandate. Some of the key points and components related to SET are highlighted below as found on the National 4-H Council Web site.



- The 4-H Youth Development Program is directly connected to the research and resources of the 106 land grant universities and colleges of the Cooperative Extension System. This connection strategically positions 4-H to strengthen U.S. global competitiveness and leadership.
- Currently only five percent of U.S. college graduates earn degrees in science, engineering, or technology, as compared to 66 percent in Japan and 59 percent in China. Thus, America faces a crisis in its ability to keep up with increasing demand for professionals trained in these fields.
- For over 100 years, 4-H has engaged our country's youth in areas such as agricultural science, electricity, mechanics, entrepreneurship, and natural sciences. Today, 4-H out-of-school opportunities also exist in subjects like rocketry, robotics, bio-fuels, renewable energy, and computer science.
- 4-H Science, Engineering, and Technology programs reach more than five million youth with hands-on learning experiences to encourage young minds and to fill the pipeline with young leaders proficient in science.
- These experiences are supported by more than a half million dedicated adult volunteers who are placing 4-H youth on paths towards successful careers.
- The 4-H Science, Engineering, and Technology program must be part of the long-term solution for improving science literacy and aptitude of America's youth. 4-H will address our nation's critical challenge by preparing one million new young people to excel in science, engineering, and technology by 2013.
- As a public-private partnership, 4-H can focus a variety of resources and expertise to strengthen young people's discovery and exploration of science. We believe fostering passion in science today will shape education and career decisions tomorrow.

Objective 3

Identify age-appropriate activities related to SET.



Information found on Slides #13-16.



As we know, abilities of our members differ depending upon their ages and developmental abilities. Next we'll see what research says are the appropriate standards for members depending upon their grade levels.

Grades K-4

- Ask a question about objects, organisms, and events in the environment.
- Plan and conduct a simple investigation.
- Use data to construct a reasonable explanation.

Grades 5-8

- Identify questions that can be answered through scientific investigation.
- Design and conduct a scientific investigation.
- Think critically and logically to find the relationships between evidence and explanations.



Grades 9-12

- Identify questions or concepts that can be answered through scientific investigation.
- Design and conduct scientific investigations.
- Formulate and revise scientific explanations and models using logic and evidence.

Objective 4

Define additional terms related to SET.



Information found on Slides #17-20.



You may hear a variety of terms similar to 4-H SET that are used to describe the idea of furthering students' abilities in these educational areas. Let's look at SET and other related acronyms.

SET – Science, Engineering, and Technology; used by National 4-H Council

STEM – Science, Technology, Engineering, and Mathematics; used by the National Science Foundation and National Science Teachers Association

STEAM – Science, Technology, Engineering, Agriculture, and Mathematics; used by the Department of Youth Development and Agricultural Education, Purdue University

Objective 5

Explore the Experiential Learning Model.



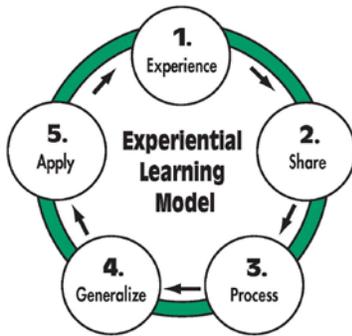
Information found on Slides #21-27.



One way that we can reinforce the learning that takes place in these activity lessons and in the SET initiative is to help the members better understand how to share their experiences, apply them to real-life situations, and generalize them to other situations in the future. 4-H projects have long been based on the experiential learning model. We've included a review of this model here to conclude this lesson.



Experiential Learning Model



Pfeffer, J.W., & Jones, J.E. "Reference Guide to Handbooks and Annuals"
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The five steps included in the Experiential Learning Model include:

1. Experience the activity.
 - a. Provide a concrete experience.
 - b. Complete the activity individually or as a group.
 - c. Accept that the activity may be unfamiliar and uncomfortable to learner.
 - d. Push learning beyond previous performance levels.
 - e. Accept the risk of failure.
2. Share reactions and observations.
 - a. Get participants to talk about the experience.
 - b. Share reactions and observations.
 - c. Discuss feelings generated by the experience.
 - d. Let the group (or individual) talk freely and acknowledge ideas generated.
3. Process by analyzing and reflecting upon experience.
 - a. Discuss how the experience was carried out.
 - b. Discuss how themes, problems, and issues emerged.
 - c. Discuss how specific problems or issues were addressed.
 - d. Discuss personal experiences of members.
 - e. Encourage the group to look for recurring themes.
4. Generalize what was learned and connect it to real life.
 - a. Find general trends or common truths in the experience.
 - b. Identify "real life" principles that surfaced.
 - c. Identify key items that were learned.
 - d. List key terms that capture the learning.
5. Apply what was learned to other situations.
 - a. Discuss how new learning can be applied to other situations.
 - b. Discuss how issues raised can be useful in the future.
 - c. Discuss how more effective behaviors can develop from new learning.
 - d. Help each individual feel a sense of ownership for what is learned.





Information found on Slides #28-31.

Group Discussion

Ask the group some of the following discussion questions.

- Why is it important that we provide 4-H members with opportunities to expand their abilities in science, engineering, and technology?
- How can we incorporate the SET initiative into existing 4-H programs and activities?
- In what ways do we currently include components of the Experiential Learning Model in the 4-H experience?
- How could we enhance experiential learning in the future?

Distribute the "Independence through Projects" Quiz questions provided as a handout (Answer key is provided as a separate sheet.)

Review the references provided on Slides #30-31.

Distribute the "Independence through Projects" fact sheet for volunteers to use for future reference.
Thank the volunteers for their participation.

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“Independence through Projects” Quiz

1. Which of the mini-lessons provided in this lesson will you lead with your 4-H members?
2. One of the goals of the 4-H SET mission mandate is to create one million new young scientists.

TRUE or FALSE

3. Planning and conducting a simple investigation is appropriate for which grade group?
 - a. K-4
 - b. 5-8
 - c. 9-12
4. What does the “SET” acronym stand for?
5. In which step of the Experiential Learning Model do learners identify “real life” principles that surfaced?



“Independence through Projects” Quiz

1. Which of the mini-lessons provided in this lesson will you lead with your 4-H members?

Any of the mini-lessons included would be an appropriate answer.

2. One of the goals of the 4-H SET mission mandate is to create one million new young scientists.

TRUE. National 4-H Council has set a goal one million new scientists by 2013.

3. Planning and conducting a simple investigation is appropriate for which grade group?

- a. K-4
- b. 5-8
- c. 9-12

a. Planning and conducting simple investigations is appropriate for students in grades K-4.

4. What does the “SET” acronym stand for?

“SET” is an acronym for Science, Engineering, and Technology.

5. In which step of the Experiential Learning Model do learners identify “real life” principles that surfaced?

The “generalize” step encourages learners to identify real life principles that surfaced as a result of the activity.

