Animal Behaviour & The Scientific Method
Wise Whiskers Session Extension

Extension Activity Overview

Students will continue to learn about *The Scientific Method* by documenting the scientific research process for one of 14 studies on dog and cat behaviour or domestication. The articles have been sorted by difficulty level and suggestions for scaffolding learning to increase accessibility for all students has been included.

Although described as a group project and presentation, the extension assignment can be used in a variety of ways. Alternatives for implementation are described on page 3.

Through the activity, students will also be introduced to a variety of tools and resources that can be used beyond the scope of our program. Additional information about these resources can be found in the *Teacher Instructions* and at the end of this document.

Estimated Time

The time required to complete the activity will depend on how you choose to implement the assignment in your classroom. Two to three 45-minute class periods will be required for students to complete the main tasks. Additional time will be needed for students to present their articles.

Curriculum Connections – Scientific Methods

Knowledge	**Understanding**	**Skills & Procedures**
Grade 5 Phenomena that cannot be directly observed using the human senses can be observed and measured using technologies. Grade 6 Hypotheses are proposed scientific explanations developed prior to conducting an investigation. Evidence and scientific explanations are subject to further investigation to determine their validity. Further investigation can involve a variety of processes, such as using new technologies and methods that reveal new evidence.	Grade 6 Explanations are used in science to answer scientific questions. Scientific explanations are constructed using reliable, objective data and evidence.	Grade 5 Discuss technologies that provide scientists with evidence that cannot be directly observed using the human senses.

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Teacher Instructions

1. Prior to introducing the assignment, watch The Scientific Method: Crash Course Biology #2 for review. You can play the entire video or stop after the section on *The Scientific Theory* (9:49).
2. Assign an article to each group or allow students to sign up for an article that interests them. Limit the use of each article so that the presentations are on different research projects. Alternatively, assign two articles per group and have students work in pairs.
3. Review the resources available to support student comprehension of their article:
    a. Rewordify – Copy challenging text from the article into the Rewordify application to simplify the language used and to generate vocabulary lists with definitions. We recommend changing the settings so that difficult words are highlighted, and definitions are available by clicking the word (Select *Learning Activities* → *Change the Level*, *Display Mode* → *Don't reword words; click/tap to see definitions*). Provide vocabulary lists and reworded articles to students as needed.
    b. Read Aloud for Chrome – Must be installed from the Chrome Web Store first. Highlight the text you want to read and click the *Read Aloud* icon on the Chrome menu.
    c. Translate for Chrome – Click on the three dots to the right of the address bar and select *Translate*. Students can select the language in the pop-up at the top of the page.
    d. DOGOnews vocabulary support → Each article from DOGOnews bolds challenging vocabulary in blue font. Students can click on the bolded word to view pronunciation and definitions.
    e. Merriam Webster Student Dictionary for Kids – Provides kid friendly definitions with pronunciation.
4. Introduce hhmi BioInteractive's *How Science Works* online application. We recommend that you go through the process of entering the information for one article prior to introducing the tool to students. Instruct students to use the **Basic Framework** to document the scientific process followed by the researchers. As information is entered, a unique visual map of the steps followed for each article will be produced. Guiding questions have been included in the *Student Instructions* to help students focus on information from the articles to enter into the *How Science Works* application.
5. Explain that students will also write their own scientific questions and hypotheses based on what they have read and will research what is already known about the topic.

6. Stress that the more information that is entered into the application, the better the Power Point presentation produced! Encourage students to screenshot images from their article to include in the template.
7. After all information has been entered into the *How Science Works* template, students will export their work as a Power Point presentation. Students must regularly save their work online or to their device. The hhmi BioInteractive website has additional information for implementing this tool in the classroom.

Alternate Activities

This activity can be modified to suite your classroom and the needs of your students. We have included a few suggested alternatives and extensions, but please make it your own!

- **Presentation Notes: Identifying Technologies & New Methods of Data Collection**
    - Students actively take notes during other groups presentations specifically on the technologies or methods used by scientists to collect data.
- **Written Reflection: Extend the Original Assignment**
    - Once all groups have presented, students complete a reflection question and use evidence from the presentations to support their explanation.
    - Question: Does the scientific method always follow a specific order?
- **Individual Assignment: Research Fair**
    - Assign one article per student. Each student is responsible for completing the *How Science Works* template and accompanying PowerPoint on their own.
    - Divide the class into two groups and assign which groups will present on day one and which will present day two. Each student presents their article to their classmates at a Research Fair, like how scientists present scientific posters at a conference.
- **Individual Assignment: PowerPoint Submission**
    - Assign one article per student. Each student is responsible for completing the *How Science Works* template and accompanying Power Point on their own.
    - Have students submit their Power Point presentation for assessment rather than presenting to the class.

Sources

1. Crash Course Biology | The Scientific Method: Crash Course Biology #2

2. hhmi BioInteractive | How Science Works

3. Rewordify | Rewordify Text Application

Reading Difficulty – Level 1

4. Science News Explores | What is my pet saying? Scientists are working to find out

5. Science News Explores | Analyze This: Some dogs quickly learn new words

6. Science News Explores | Yes, cats know their own names

7. Science News Explores | Even raised by people, wolves don't tune into you like your dog

8. News For Kids | Scientists learn that dogs can smell stress

9. DOGOnews | Are you a cat whisperer?

10. DOGOnews | Surprise! Your dog can tell if you are happy or angry

Reading Difficulty – Level 2

11. Science Journal For Kids And Teens | Where did cats first start living with people?

12. Science News Explores | A dog's breed doesn't say much about its behavior

13. Science News Explores | Analyze This: Puppies naturally mimic human actions

14. Science News Explores | Good dog! Canine brains separate tone of speech from its meaning

15. Science News Explores | How to tell if cats are having fun – or if fur is flying

16. National Geographic Kids | Wolf language and communication: Explore how wolves use their voices, body language and odour to talk to one another

Reading Difficulty – Level 3 (Advanced Readers)

17. Science Journal For Kids And Teens | When and where did humans domesticate wolves?