

DOLPHIN RESEARCH CENTER

Mission: Observation!

Grade Level: 3rd-5th

Objectives: Students will be able to observe and record data and enhance their experience and understanding of the scientific method in a meaningful way.

Florida Sunshine State Standards:

Science

SC.H.1.2.1: The student knows that it is important to keep accurate records and descriptions to provide information and clues on causes of discrepancies in repeated experiments.

SC.H.1.2.2: The student knows that a successful method to explore the natural world is to observe and record, and then analyze and communicate the results.

National Science Standards:

Content Standard A (K-4) - Understanding about Scientific Inquiry:

- Scientists develop explanations using observations (evidence) and what they already know about the world (scientific knowledge). Good explanations are based on evidence from investigations.
- Scientists make the results of their investigations public; they describe the investigations in ways that enable others to repeat the investigations.
- Scientists review and ask questions about the results of other scientists' work.

Content Standard A (5-8) - Understanding about Scientific Inquiry:

- Different kinds of questions suggest different kinds of scientific investigations. Some investigations involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve seeking more information; some involve discovery of new objects and phenomena; and some involve making models.

Background: At Dolphin Research Center, DRC, research is our middle name. What **is** research? It is finding the answers to your questions. There is no one way to find the answer to a question. You can interview someone, read books, articles, make observations, and even study other research. **There are two main types of research: passive and active.**

Passive research is one in which data is collected through observation. By watching the dolphin's natural behavior we can learn things such as dolphins' physical and behavioral development and social interactions.

Some of our most important research involves keeping records. We keep very detailed husbandry records and each time a trainer interacts with our animals they must enter their session into our databank. Records are kept on everything from water temperature to caloric intake. This serves as baseline data for healthy animals and we can use this to help determine the condition of marine mammals that strand.



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Active research is used to understand dolphins' physical or mental capabilities. In this research, researchers have direct involvement by asking questions and then manipulating their environment to find answers.

When designing a research project, whether passive or active, scientists must first decide exactly what question they are asking. To do this they use the scientific method. Do you know what the steps are?

1. Formulate a question
2. Make a hypothesis
3. Collect and record data
4. Analyze data
5. Form conclusion

At Dolphin Research Center, our research mission is to learn from and about dolphins and teach what we know for the mutual benefit of both species. If we calculate how often several healthy dolphins in human care breathe in a five-minute period, then we will have a better indication of how many breaths per minute a healthy wild dolphin would take. The more we learn about our dolphins here at DRC, the better we will understand their wild cousins out in the open ocean. Our data will give us a baseline for a healthy Atlantic bottlenosed dolphin so in the future we can help care for a stranded or injured dolphin and help determine if their breath rates are within the boundaries of the baseline of a healthy dolphin. To do this we use a variety of methods of research. In addition to the research projects that we come up with in-house, we receive proposals from scientists around the world. This activity focuses on the importance of observation in the scientific method or research in general.

Materials:

- Paper
- Pens
- Handout- Observation log

Teacher Prep Notes: Make copies of the handout and fill out a sample observation log to model for the students.

Procedures:

1. Review the steps of the scientific method.
2. Ask students if they think all scientists wear lab coats? Remind students that EVERYONE is a scientist! This lesson will focus on OBSERVATION.

Key Terms

Observation: The result of using the five senses to take note of details and to make descriptive accounts of what is being observed for scientific purposes.

Scientific method: A step by step (five step) scientific approach to acquire knowledge.

Hypothesis: Educated guess about what will happen

Data: Factual information

Research: The collecting of information about a particular subject



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3. Is observation important in science? Why? What does it mean? Go over keywords.
4. Review handout with class- either read aloud, take turns, in groups, pairs, etc.
5. Discuss afterwards.
6. As a class, individually, or in groups/pairs, follow the directions and design a research project using the scientific method and focus on observations.
7. A class pet or plant is ideal for the project!

Wrap Up: Share project/s and discuss conclusions and observations.



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Have you ever heard of the scientific method? The same scientific method that you learn in your classroom is used all over the world in all different areas of study, from what goes into the soap that you use or solving worldly problems like pollution, to finding cures for diseases, or even to discovering more about the intelligence of dolphins! We use the steps of the scientific method here at DRC when we design our research projects. Let's take a look at the steps of the scientific method.

STEP 1: To begin any research project, you have to start with a question-- something you would like to test or find an answer to. It is very important that you approach any project in a safe and beneficial way for yourself and your research subject/s. You don't want to harm yourself or others in any way.

STEP 2: Make a hypothesis or make an educated guess about what you think will happen in an "if...then" statement.

STEP 3: Test your hypothesis...this is experiment time! This where you actually go about finding the answer to your question and testing whether or not your guess was correct.

Some research can be **active** where you **do** an experiment; others are more **passive** because it involves you observing. Either way, make sure you collect your data! You can write it down, calculate it using math, draw it, there are all sorts of ways to collect data.

STEP 4: After you have collected enough data and repeated STEP 3 several times to make sure your data is accurate, you will analyze your data and form a conclusion. You look back at your hypothesis and see if what you thought might occur did or didn't happen. Do you think scientists are right all the time? Of course not! That is what makes science so fun. So many discoveries are made because hypotheses have been proven wrong. Even potato chips were made by accident!

STEP 5: Share your data with others! Doing so will prevent other people from possibly wasting time!



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Let's look at a research project involving our dolphins at DRC.

STEP 1: Do breath rates vary from males to females?

STEP 2: Form an educated guess and state why. You might decide that males will take more breaths because of their activity level or females because they are more curious about what is happening above the water so they come up to breathe more often.

STEP 3: With a stopwatch, a clipboard with paper, a pencil, and the name of the dolphin we are observing, we go out on our boardwalks or up to our research tower (depending on the dolphin/s we are observing). We start the stopwatch as soon as we see that specific dolphin breathe. We can see a mist sometimes and/or hear the air coming in and out of the blowhole. Then, for the next five minutes, we write down the time each breath was taken.

STEP 4: We repeat STEP 3 with several dolphins several times a day for a year and then gather all the data and calculate how many times a healthy male dolphin would breathe in a five-minute period in comparison to a female.

STEP 5: Once our conclusion is formed and thoroughly tested, we will be ready to share our results with other facilities!

Are you ready to design your own research project? Give it a try!

Let's focus on OBSERVATION! Think about what you can observe at home. Do you have any pets at home? Fish? Hamsters? Cats? Dogs? Rabbits? Iguanas? Birds? How about a plant? Based on what you know about observations and the scientific method, design your own passive research project. You will observe and record your data for one week. You can use the sheets provided to record any data. You can write it down or draw a picture and label it!

Have fun!



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NAME: _____

ANIMAL: _____

DATES OBSERVED: _____

1.QUESTION: _____

2.HYPOTHESIS: _____

3. RECORD DATA: USE SHEETS PROVIDED TO WRITE OR DRAW AND LABEL DATA

4. ANALYZE DATA: LOOK FOR PATTERNS IN BEHAVIOR, COMPARE AND CONTRAST OBSERVATIONS AND WRITE IN THE SPACES PROVIDED

5. FORM A CONCLUSION: WHAT DID YOU LEARN? _____



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Monday	7 a.m.	3 p.m.	6 p.m.	8 p.m.
Tuesday	7 a.m.	3 p.m.	6 p.m.	8 p.m.
Wednesday	7 a.m.	3 p.m.	6 p.m.	8 p.m.



DOLPHIN RESEARCH CENTER, 58901 Overseas Hwy, Grassy Key, FL 33050
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Thursday	7 a.m.	3 p.m.	6 p.m.	8 p.m.
Friday	7 a.m.	3 p.m.	6 p.m.	8 p.m.
Saturday	9 a.m.	12 noon	3 p.m.	8 p.m.
Sunday	9 a.m.	12 noon	3 p.m.	8 p.m.



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