Nature Sink/Float

ACTIVITY OVERVIEW

STEM Focus Area: Nature Play

Facilitator Learning Goal: Youth will learn about what objects in nature sink and float and make comparisons between them.

Youth Learning Targets:

- "I can test objects and conduct experiments."

LEARNING ENVIRONMENT

Activity Duration: 30 minutes

Class Size: Any Size

Minimum Group Size: none

Type of Space: Indoor or outdoor

Age of Youth: Preschool

Guiding Question: What is the question to explore OR the problem or challenge to solve?

What objects in nature sink? What objects in nature float?

Through this activity, youth will:

- Predict and hypothesize if an object will sink or float in water.
- Observe and investigate objects in water.
- Analyze and infer why an object might sink or float.
- Test and revise whether similar looking objects react the same in water.
- Draw conclusions and relationships between objects that sink and float.

Facilitator Prep:

Facilitators will need to collect natural materials for youth to test such as sticks, rocks, leaves, flowers, nuts or seeds, tree bark, feathers.

Literacy Connection: Great books to get youth support learning about *(available on Amazon).*

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- Are You a Scientist? by Tad Carpenter
- Vivi Loves Science: Sink or Float by Kimberly Derting
- Floating and Sinking by Amy Hansen

DoS:

✓ **Predict and hypothesize**
Develop and use models
Measure materials
✓ **Observe**
✓ **Investigate**

Record observations
✓ **Analyze and infer**
Share and communicate data
Interpret data
✓ **Test and revise**
✓ **Draw conclusions and relationships**
✓ **Have voice and agency, make decisions and guide their own learning**

PREPARATION

Material

Bins with water (at least 3 inches deep), towels (in case of spills), a variety of natural materials, Sink or Float? by Josie Stewart

Room

This activity can take place indoors or outdoors. If indoors, the room should be set up with bins at tables or on the floor where spills can easily be cleaned up.

Content

The density of an object determines whether it will sink or float. Objects that sink are denser than objects that float. The denser the object, the closer the molecules of that object are together.

You can change the density of some objects by increasing its surface area or filling it with air.

Common misconceptions:

- An object's weight determines whether it will sink or float

Inquiry

Your primary goal as facilitator is to encourage youth to explore different objects in nature and lead their own learning. You can prompt discussions and observations with questions like the following:

- Do you think this object will sink or float? Why?
- What do you notice about the objects that sink?
- What do you notice about the objects that float?
- What happens if you put a rock on top of a leaf?

DoS:

- ✓ Organization: I practiced the activity/technology, prepared materials/extras/place to record youth ideas, completed an activity (including timings).
- ✓ Materials: Materials are appropriate for teaching the learning goals; youth will be able to use them and will think they are appealing.
- ✓ Space Utilization: The space is set up appropriately for the activity and there will be no safety issues or distractions.
- ✓ Relevance: I have researched why the content matters to youth's everyday lives.
- ✓ Content Learning: I have become familiar with the content.
- ✓ Inquiry: I have become familiar with how authentic, age-appropriate inquiry practices look in this activity.

INTRODUCTION TO ACTIVITY (10 MINUTES)

As a group, discuss what it means for objects to sink and for objects to float.

Read the book: Sink or Float? by Josie Stewart

Pick two objects, let the kids explore the objects by sight and touch and make predictions through a raise of hands if they think the object will sink or float. Record their answers and ask a few to share why they think it will sink or float. Then test the objects to see if they were correct.

DoS:

- ✓ Space Utilization: I will use the space informally avoiding the lecture hall format.
- ✓ Purposeful Activities: This intro section gets youth on track for the learning goal.
- ✓ Content Learning: If age appropriate, I will accurately present content.
- ✓ Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- ✓ Relationships: I will make each youth feel welcome.
- ✓ Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- ✓ Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.

ACTIVITY ENGAGEMENT (20 MINUTES)

Split youth into small groups of 2-3. Instruct them to pick different natural items and predict if they think the object will sink or float. Then have youth observe if their predictions were correct by dropping their item in water.

Have them test if there are changes they could make to their item that could make it do the opposite – if it floats, can they make it sink? If it sinks, can they make it float?

DoS:

- ✓ Space Utilization: I will use the space informally avoiding the lecture hall format.
- ✓ Participation: All youth will have access to the activity.
- ✓ Purposeful Activities: This core section helps youth to move toward the learning goal.
- ✓ Engagement: This activity has youth physically engaged with their hands and their minds.
- ✓ Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- ✓ Reflection: If appropriate, I will ask youth questions during the core activity that will help them make sense of what they are learning.
- ✓ Relationships: I will take steps to share my enthusiasm and create a nurturing, safe learning environment.
- ✓ Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- ✓ Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.

FINAL REFLECTION AND RELEVANCE (5 MINUTES)

Bring youth back together as a group. Ask them if there were any objects that surprised them.

How can we apply what we've learned to our lives? What do we know about ducks? What are ducks covered in? Ducks have hollow bones, could that help them float? Ducks cover their feathers in oil, could that help them float?

What do we wear when we're riding on a boat? Are life jackets filled with objects like rocks or is there a lot of space for air in them?

DoS:

- ✓ Space Utilization: Again, I will use the space informally.
- ✓ Participation: I will prompt youth who do not have access to the activity to participate.
- ✓ Purposeful Activities: The closing section helps youth to reach the learning goal.

- ✓ Content Learning: I will help youth make connections between different ideas. I will create opportunities for youth to ask questions/provide ideas that show a deeper level of understanding.
- ✓ Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- ✓ Reflection. I will provide youth with a sustained opportunity to make sense of their learning.
- ✓ Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- ✓ Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.