

The Floating Peanut Task

Background:

The floating peanut task is based on an experiment initially conducted with orangutans in order to test their ability to insightfully solve problems. Insight, in this context, refers to the process of solving an unfamiliar problem by approaching it in a new way after a series of unsuccessful attempts. The task, which was subsequently tested in children and other non-human primates, consists of extracting a peanut floating in a clear plastic tube by pouring water into the tube. Success in this task is thought to demonstrate non-human primate's capacity to use tools in an innovative and insightful way. Failure to complete this task has sometimes been attributed to *functional fixedness*, which is defined as a cognitive barrier which impedes actors from using tools in unusual ways. In this case, using water to procure the peanut is 'unusual' because water is typically used for drinking or washing.

Children and the floating peanut task:

This task is ideal for children between the ages of 5 – 8 years old. Within this age range it is typical for around 50% of children to be able to solve the task (Hanus et al., 2011). This is ideal, because it means it is more meaningful to the children to see that a non-human primate is capable of solving the problem. It also provides the opportunity to demonstrate functional fixedness and explore *why* the task is 'tricky'. Depending on the age of the students, you may need to adjust the scope learning outcomes that you focus on. For 5-year-olds, for example, the task may serve to give an example of non-human primate's intelligence and introduce children to the concept of tools and why they are important. With 8-year-olds, on the other hand, it may be possible to delve further into the concepts of functional fixedness and insightful tool use.

Materials:

- **1 clear tube**
- **1 small pitcher of water**
- **1 small buoyant object** (to be extracted from the tube; e.g. a peanut, a crumpled ball of tin foil)
- **Assorted 'distractor' tools** (e.g. pencils, pipe cleaners, feathers, tongs, string, straws, popsicle sticks)
- **Projector/screen** to display video (link: <https://www.youtube.com/watch?v=Qw1WzCBZ9Kc>)



Floating Peanut Task Demonstration

Lesson Plan:

Preparation:

Set up the task on a table in front of the classroom (see example image above).

Introduction:

It is up to you how much information you give about the task initially. You could introduce it as something that non-human primates have done, or you could leave that part as a 'surprise' for the end.

Explain to the children that you have a challenge for them – that their objective is to get the floating object out of the tube using *any* of the things on the table (this should consist of the pitcher of water and the 'distractor' tools). You could also introduce some kind of incentive for the students to complete the task (e.g. a sticker).

Demonstration:

With a large group of students, it may be a good idea to have students come up to the table one at a time and ask them to choose just one of the tools to try to get the object out of the tube. This way, more than one student can give the task a try and no individual student feels 'put on the spot'. In a smaller group, it may be better to let one child keep trying different tools until they solve the problem (potentially with some hints, if they are struggling). Ideally, children will first try a few of the other tools before using the water, but it is possible that a student could solve the problem on the very first try. In this case, you can commend the child for solving the task but still ask a few more volunteers to the front to 'see if they can use any of the other tools' as an opportunity to demonstrate that the water is the most efficient solution.

Explanation:

Once the demonstration is finished, explain to the children that non-human primates are able to complete this task and how this demonstrates their ability to use tools. Ideally, you can do this by showing them a video of an orangutan solving the problem. Introduce the concept of animal research and the notion that there are scientists exploring the capabilities of non-human animals.

Explain exactly what tools are and why they are important. Ask the class to come up with examples of tools that humans use and what they help us do. Try to convey the idea that tool use is a sophisticated adaptation that some non-human animals have, but not at the same level as humans.

Depending on the age group of the students, you may be able to explain the concepts of *insightful* tool use and functional fixedness. Examples may be helpful for this (e.g. using a paper clip to open the SIM compartment on your phone is an *insightful solution* that could be missed due to *functional fixedness*). Encourage students to come up with their own examples of insightful tool use and functional fixedness.

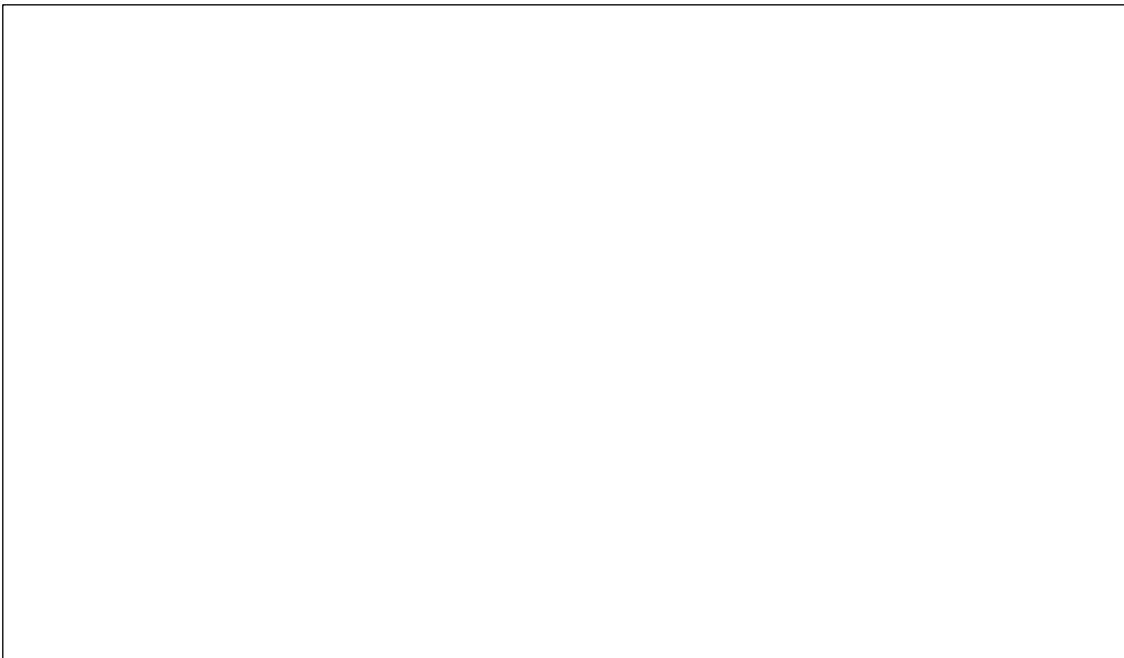
Depending on their age, students can then complete the worksheet (attached below) in class or as homework

The Floating Peanut Task: Worksheet

- What is a tool? Give an example of a tool that you use every day.

- Why is it hard to find the solution to the floating peanut task?

- What do you think an orangutan can do? Draw a picture of an orangutan completing a task that you have designed as a scientist of the future.



References:

- Hanus, D., Mendes, N., Tennie, C., & Call, J. (2011). Comparing the performances of apes (gorilla gorilla, pan troglodytes, pongo pygmaeus) and human children (homo sapiens) in the floating peanut task. *PLoS ONE*, *6*(6), e19555. <https://doi.org/10.1371/journal.pone.0019555>
- Mendes, N., Hanus, D., & Call, J. (2007). Raising the level: Orangutans use water as a tool. *Biology Letters*, *3*(5), 453–455. <https://doi.org/10.1098/rsbl.2007.0198>
- Shettleworth, S. J. (2012). Do animals have insight, and what is insight anyway? *Canadian Journal of Experimental Psychology*, *66*(4), 217–226. <https://doi.org/10.1037/a0030674>