

3-5  
years

**Science Content:**

The Swing Game

**Science Content:**

Physical Science

**Target Concepts/Skills:**

Physical properties related to the behavior of a pendulum, e.g. periodic time of swing for a pendulum of different weight, length of string etc. The projection of a swing when oscillating can also be included.

**Target Age group:**

3-5 years old

**Duration of activity:**

45 minutes to carry out a selected inquiry investigation

**Summary:**

Children in small groups start the activity with exploring the swing game (game with a swing and cones). After this exploration phase, children are confronted with specific scientific problems concerning the swing game. For example: If you want to make a swing game, then you need a good swing. What is a good swing? And what can the rules for the game be? How can you make such a game of your own?

Different research questions can be part of the activity while children build their own swing! Which swing takes the longest time back and forward?

Which materials are the best to attach on the rope? What are the best objects for the swing to hit? While the children are building, they are engaged in an inquiry activity. They want to build a

swing which meets the expectations of the game they have in mind. In order to integrate the results of the inquiry into the game, children need to have the chance to do the research themselves. They need time and opportunity to test and compare materials and results.

**Objective and learning outcomes:**

Children have the opportunity to explore and study the properties of a swing/pendulum.

By the end of the activity children would be able to:

- know that something on a string suspended will swing when it is 'pushed' or 'pulled' and let go. That the swinger (pendulum) can knock items in its path over;
- Carry out with guidance, systematic observation, questioning, planning and recording to obtain evidence;
- With guidance, plan and execute a simple experiment to test inquiry question;
- Identify some principles of swings by executing experiments with the swing game: length of string make it swing slower, heavier bob has greater impact on hitting objects etc.

**Resources:**

- Swing from which the length of the rope can be changed. (eg with duplo blocks)
- Different weights that one can easily attach onto the swing (see worksheet in attachment)
- Different materials that can be used for the swing to hit;
- Worksheet that accompanies the inquiry process (see attachment)

*The swing is like a pendulum with a string and mass tied to its end, suspended from a height. You can use stands from the science lab or else you can have a wooden stick or plastic pipe stuck to a base as shown in the picture below. If these are not available, you can ask the children to hold the pendulum string themselves.*

# The Swing Game

**Authors:** Kristof Van de Keere, VIVES, Belgium

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# The Swing Game

## 1. Engage (Forming hypotheses)

*Decide which question to investigate (= the challenge)  
What do children already know? What are their ideas?*

Children first explore the swing game with the cones and play with it. They experience how the swing hits the cones..

After the exploration, the teacher asks:  
Do you want to make a swing for yourself? Well, of course we first need to have a good swing. What could be a good swing?  
What kind of swing are you going to make?  
What will be the rules for your game?

The teacher guides this process and gives no feedback on the content of the concept of the swing. He/She only scaffolds the children to express their findings to each other and to find some challenges children can investigate.

**It is really important that children first can explore a swing and can find out while playing what makes a good swing. The question “What could be a good swing” only makes sense after the children have experienced the game.**



## 2. Inquiry (Designing and running experiments and observations)

*Plan and conduct investigations in order to collect data*

Now the children have the time to use the materials mentioned (see also attachment) in order to build their swing game. From now on they are engaged into real inquiry. While they are busy, the teacher can observe and engage the children into inquiry.

With younger children it is good to start with the question: What will be your rule of the game and what do you need to do in order to win the game? It is important for the children to allow them to take ownership of the game's creation. This is important in engaging them and allowing for a more effective scientific inquiry.

These are possible questions a teacher can ask while children are working on their swing.

- How are we going to build the swing?
- What are you going to do first?
- What do you think will happen?
- Why do you think this will happen?

- Which swing goes real long back and forward? (a long swing or a short swing?)
- Which weight is the best to attach onto the swing? (heavy or light)
- Which cones do we use best to make our play successful?
- (See attachment below for more information about the challenges and the materials to be used)

You can decide which of these questions the children can investigate as part of their inquiry.

The children can build the swing in their groups. All elements come now together: the swing, the weight, the cones, the place of the cones. The children are working on the swing and are guided by the different teacher questions.

So before the game can be played, the children have to think about some options on how they will have to build the swing. They also need to take into account the different playing rules that were put forward earlier (see above).

# The Swing Game

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## 3. Evaluation (evaluating evidence)

*Conclusion: use data to construct knowledge and generate evidence.*

*Demonstrate understanding of concepts and/or ability to use inquiry skills*

Now, the teacher can set up a discussion in order to see which swings are successful. Give chances to the children to do some changes to the construction.

If children look back onto the activity, can they explain how they have to construct the swing game, so that it is fun to play?

When all groups are ready, the different games are compared now while playing.

Some criteria were important while constructing the game:

- How good is the swing? Is it a long one or a short one? Why?
- What did you attach on the rope in order to hit the cones? Why did you use these materials?
- Are the cones/materials adapted to the force of the swing?
- Is the place of the cones/materials good?

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### Materials in attachment:

Sheet with possible challenges in the activity



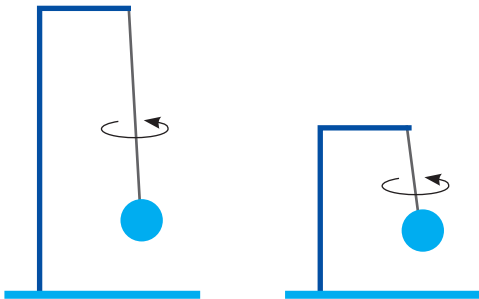
## The Swing Game

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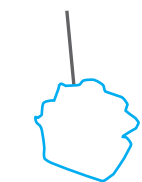
#### Materials for the children to be used:

- Rope
- Adhesive tape
- Different weights to attach onto the rope (marble, stone, bouncy ball, stick, piece of paper)
- Different objects to hit with the swing (plastic bottles, cans, glass bottle, ..)

#### Possible criteria for the swing to take into account and for the teacher to ask questions Which swing moves the longest?



#### Which materials are the best to attach onto the swing?



piece of paper



wooden branch



marble



heavy little box



light little box



bouncy ball

#### What are the best objects for the swing to hit?



plastic bottle



glass bottle



tin cans



paper cylinders