

A Technology Education Project

# Module 5: An exciting basement - Design your machine.

## Story:

A new day dawns. Tuka, Maco and Waaba have gathered in the usual place, but they're feeling even more excited than normal. Today, Maco has promised to show them an exciting place that they've never seen before. "Follow the leader!" shouts Maco, as he leads them down a narrow spiral staircase into the dark, damp basement. Luckily, he lights a miracle lamp that sounds a warning whenever there's a spider or water dripping from the ceiling. "This is so exciting!" Waaba yells, as cheerful as usual. "Why are we even coming down here?" Soca asks doubtfully. In his opinion, this is exactly the kind of place where unexpected things can happen. However, encouraged by the others, he dares to continue the journey into the unknown.

"Wait a moment! It must be somewhere around here!" shouts Maco, and continues to plunge deeper into the basement. Tuka has been given the task of carrying a piece of timber, which goes snick-snack as she walks. "I should have guessed!" Soca is quite sure that the timber will break at any moment. He wants to get out of the basement as quickly as possible, but he can't imagine returning up the dark stairs alone. Just then, to Soca's relief, Maco returns carrying a dusty chest in his arms. The whole Kip crew heads back upstairs.

Maco rummages excitedly through his treasure chest and throws out all manner of objects. The first thing that flies out of the box is a soft, green feather. A small, round, blue button shoots out next... and hits Waaba right in the forehead: "Ouch!" (Oops! That was a mistake!) They all burst out laughing. Luckily it didn't hit her in the eye! Maco says sorry and promises to calm down. He continues looking for treasure, but more carefully and without throwing things around. Finally, the crew find a whole load of things in front of them in addition to the button and colourful feathers. There are also sticks, small rocks, dry leaves, flowers and hay. There is also a great assortment of strings and threads, fishing line and stretchy rubber bands!

As Tuka stares at all the material, her fingers are already itching to get started. She suggests that the crew should get to work right away. But Maco reminds Tuka of an important task that they have to do before they can start building the machine. "A well-planned job is half done!" That's the first step. Maco goes to his design cupboard and fetches a piece of paper and a pencil for each member of the crew. Everyone can draw their own design for the kind of machine they want to build. Waaba has one more important question before she can start drawing: "So what does 'a moving machine' mean?" That's a good question to think about together!

Waaba is working on her own design using light, circular motions. The others are finding it difficult to picture an image in their minds, but Waaba has a clear idea of what she's going to build. Her design shows a fun and happy machine that moves on spinning wheels.



© Technology Industries of Finland & Fun Academy Soca has drawn a simple sketch of a machine for growing flowers. The moving part in his machine is a lid that opens when you pull a string. Soca can already picture all the flowers that his machine will grow, and he can't wait to practice his language skills with them. By the way, did you know that Soca is the only member of the Kip crew who can speak the language of flowers and animals?

Maco's design is very precise and full of tiny details. His problem-solving robot moves and talks when you press a square button. Tuka draws so quickly that she has finished her entire design before the others have even started. Tuka has designed a catapult that shoots things as fast as a rocket using a doubled rubber band.

Looking at their amazing designs, Waaba realises they're going to need some soft and flexible materials to wrap around the different parts. She promises to bring some with her next time!

**Discussion tips:** Why is planning an important part of the job? In what ways can you plan your own work? What does 'a moving machine' mean? When you work in a team, does the team always need a leader? Is the leader always the same person or character? What other roles can there be in the team, in addition to the leader?

#### Newslink:

www.thisworks.fi/spiders

#### Game: "Follow Maco"

The team members form a line and the student at the front of the line makes some different movements: such as walking on their tiptoes, crawling, walking sideways, stomping their feet, clapping their hands. The other members of the team follow the leader, copying their movements. **Tip:** Try playing the game with the whole class at once. Can you follow the leader as easily in a long line as you did in a short line?

#### **Exercise:**

Design your very own moving machines of the future. Use white paper and pencils. **Tip:** You can also use information and communication technology to create your designs, or build a three-dimensional model out of plasticine.

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#### Suggestion for pre-schooler cooperation:

Go outside in small teams and collect five natural materials of different types and weights (such as leaves, small stones, sticks, moss, feathers, hay, berries, flowers). Place a bucket or basket about a metre away from the team members. They should then try to throw each type of material into the bucket, one at a time. **Tip:** Before throwing an object, the team should come up with a hypothesis. After the exercise, think about why some materials flew into the bucket more easily than others.

#### Suggestion for mentoring cooperation: "Waaba's drawing school"

The mentor and student form a pair. One is the artist, the other is the instructor. The teacher draws or projects a simple picture on the board. The artist has their back to the board. The instructor gives simple commands to the artist. Based on these instructions, the student will try to draw the same shape as the teacher. You aren't allowed to say the name of the shape! The whole class can admire the finished drawings together.



### Oops! That was a mistake!

What mistake was made in this module's story? Are mistakes made by accident or on purpose? Or can they be both? How can you say sorry if you made a mistake by accident? Did you make any mistakes by accident in this module? How did you handle them?

#### Documentation

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Take a photo of your own design and save it in your portfolio. Also take a photo of the den you built at home!

#### Homework

1) Make your own den at home and take photos. Ask your parents for help! Tell the other students at school about your den. Did your den have a roof? How many walls did it have? And what kind of doorway? Could you fit inside it? **Tip:** You can also write about your den: a few words or sentences, or even a short story. Who do you think might live in the den?

2) Bring some flexible materials from home (such as foil, empty coffee packages, fabric).

#### Message for parents

This module, Tuka, Maco, Waaba and Soca led us down into an exciting basement at Maco's house. Among the spiders and the water dripping from the ceiling, they found a treasure chest that was full of suitable construction materials. This module, we practiced cooperative skills and following instructions. We also got to draw designs for our very own moving machines! Our homework for this module is to build a den at home. We could use things such as chairs and blankets, or maybe even wood and nails if we have some help. We'd like you to help us build our dens. Now that we've completed the tasks and exercises for this module, we should bring in some flexible materials for our machine (such as foil, empty coffee packages and fabric).

## CURRICULUM: 💥

When doing this module's activities with your students, you should note the following objectives and content for elementary instruction:

- TC5: practical ICT skills and own output
- ENV: research and experimentation, problem-solving
- MA: writing step-by-step instructions and following instructions
- HC: planning, learning how to use ICT as part of creative and documentation processes

#### This is based on the Finnish National Curriculum



