Are you looking for ideas on how to run a PicoCricket workshop? This guide provides suggestions for a workshop called *Making Faces*. In the workshop, participants use craft materials to create the face of a person or animal, then attach their creation to a motor and program it to spin in different ways.

**Goals of the Workshop**

This workshop is designed to help participants:

- Make a creative project that can move
- Gain direct hands-on experience with motors
- Learn to program objects to move through a sequence of steps
- Become interested in – and feel capable of – creating with new technologies

**Ages**

The workshop can be adapted for a wide variety of ages, from young children (ages 7 and up) to adults.

**Duration**

Designed to be 2 to 3 hours
If possible, set up chairs so that everyone begins facing each other, around a table or in a circle of chairs.

Computers should be set up with PicoBlocks software and a Beamer. Ideally there should be enough table space next to each computer so that participants can go back and forth between building their projects and programming.

If there are computers near the initial circle, you may want to start with the monitors off or laptops closed, so that workshop participants are not distracted.

For each moving face sculpture, you will need the following setup:

- PicoCricket
- Cable
- Motor board
- Motor
- Motor connector (black LEGO squares at each end)
- Axle
Set up a table with materials.
Below is a list with some suggested materials. Feel free to adapt the list. Consider using recycled materials, natural items, and other locally available materials.

Make sure the materials table is readily accessible. If you are working with young children or if the materials table is not easily accessible for all participants, you may want to put a small collection of materials on each table for ease of access.

<table>
<thead>
<tr>
<th>Materials (feel free to vary)</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>styrofoam balls (or scrap pieces of styrofoam)</td>
<td>Basic structure (face)</td>
</tr>
<tr>
<td>paper plates (plain, for drawing on)</td>
<td></td>
</tr>
<tr>
<td>construction paper</td>
<td></td>
</tr>
<tr>
<td>pipe cleaners (also known as “chenille sticks”)</td>
<td>Floppy stuff (hair, arms, etc.)</td>
</tr>
<tr>
<td>ribbon, yarn, or crepe paper</td>
<td></td>
</tr>
<tr>
<td>googly eyes</td>
<td>Eyes and other features</td>
</tr>
<tr>
<td>felt tip markers</td>
<td></td>
</tr>
<tr>
<td>beads, bells, gems</td>
<td></td>
</tr>
<tr>
<td>hot glue gun with sticks (low melt)</td>
<td>Attaching</td>
</tr>
<tr>
<td>tape (clear, masking, and/or duct tape)</td>
<td></td>
</tr>
<tr>
<td>rub-on glue stick</td>
<td></td>
</tr>
<tr>
<td>scissors</td>
<td>Cutting</td>
</tr>
</tbody>
</table>

You may want to group similar materials together on the table. One way to organize the materials is to set them out in plastic cups and plates.

Another way to group materials is to use colored masking tape on the table to separate and label different types of materials (such as different PicoCricket parts). You might want to use an inexpensive vase to hold the pipe cleaners.
Overview

To begin the workshop, welcome everyone, introduce yourself and give a brief overview of the workshop.

Here are some examples of overview statements:

“We will make faces that can spin and make sounds.”

“You can make a spinning sculpture with the face of an animal, person, or any other character you choose.”

“We will make faces using craft materials, then learn to program them to move and make sounds.”

Introductions

If participants are meeting each other for the first time, go around the circle and ask each to say their name.

To get in the spirit of the workshop, in addition to their name, you could ask them to make a face (surprised, funny, or other expression).

You could do this in the format of a “name game” – where each person in the circle has to say the name and make the facial expression of each person who went before them, and then add their own name and make a face.

Therefore the last person ends up naming and repeating the facial expression of every person in the circle, starting with the first person and ending with their own.

An alternative to making a face would be to name a favorite animal.
Sample Projects

Show an example project to give participants a sense of what they can create. You can demonstrate how to create a project during the workshop. Or, if you prefer, you can prepare the project before the workshop.

If you show more than one sample project, try to select projects that appeal to kids with different interests or styles. For example, you could show a face of a cute animal and one of a funny character. Keep the examples simple.

Here is one way to create an example:

Place a Styrofoam ball on a LEGO axle. You can attach googly eyes or gems for eyes. Use pipe cleaners to add ears or other features, such as whiskers for a cat or antennae for an insect.

Then, stick the axle in a LEGO motor. Connect the motor to your PicoCricket, as shown on page 2.
Introduce programming

Demonstrate how to program the motor to spin.

1. Turn motor on for 1 second:
   - Double-click to send program to the PicoCricket

2. Make sure the Cricket is on and that the antenna are pointing at the Beamer

3. Motor on for 5 seconds:
   - Double-click to send program to the PicoCricket

Want to try more?
You can tell the motor to reverse direction:

1. Motor on for 5 seconds:
   - Gets set to reverse
   - Double-click to send program to the PicoCricket

If you want to add sound...
Plug in the soundbox

1. Motor on for 5 seconds
2. Motor on for 5 seconds
   - Gets set to reverse
   - Double-click to send program to the PicoCricket

Play a sound
(you can choose which sound by clicking on the arrows)

Press the round button to play the program again
Brainstorming

Have paper available for those who want to sketch their ideas. Help participants brainstorm ideas for their Making Faces project. What face they like to create. Do they have a favorite animal? A favorite cartoon?

Introducing Materials

Some people do not get ideas from talking or drawing, but are able to get ideas from tinkering with the craft materials. Point out the different types of materials that are available on the materials table.

If you have hot glue, make sure to give safety warnings. (You may want to designate a “dangerous table” with the hot glue and/or sharp tools.)

Forming Groups

You may want to give participants the option to work with someone else or on their own. However, if there are not enough materials then ask everyone to find one or two people to work with.

Diving in

Encourage participants to take materials and start making a face. If they don’t know where to start, encourage them to start experimenting with a motor or other materials.
ideas for Creating Faces

There are many different ways to create faces.

You can draw a face on a paper plate.

Or, use construction paper to create an animal or other character.

You can use masking tape to attach the creation to an axle.

Participants often naturally move back and forth between creating and programming.

Programming Tips

You can change the power, timing, and direction to get different kinds of motion.

For a step-by-step intro on how to program PicoCrickets, see the PicoCricket Getting Started guide.

www.picocricket.com
**Show and Tell**

Hold an exhibition of projects at the end of the workshop. Ask each person or group to demonstrate their project.

*You may want to ask:*

- “Does it have a name?”
- “What does it do?”
- “What surprised you?”
- “What would you try next?”
- “What was the hardest part?”

**Documentation**

You might ask participants to document their projects. Documentation can take the form of an exhibit label, a design notebook, or a story about their creation.

*Potential questions include:*

- “What is the name of your creation?”
- “What is your favorite aspect?”
- “What does the program do?”
- “What were the steps you took to create it?”
- “What is a problem you had to solve when making it?”
- “How did you solve it?”
- “If you had more time to work on it, what would you do?”
- “What piece of advice would you give to someone else working on a project like this?”
Participants can document their project using multiple media and representations.

Participants can sketch a drawing of the overall creation, as well as close ups of their favorite part. They could also make a diagram to illustrate how it works.

Using a video or digital camera, they can document their creation in action. A video camera can also be used to record an interview or documentary about the steps they went through to create their project.

**Assessment**

The documentation that participants produce gives a window into assessing their learning. Here are some other strategies for assessment.

One way to assess learning is through learners’ conversations and questions during the process of creating their project. Another way is by observing how and what engaged participants’ interest.

The participation and performance of the group can be assessed, in addition to looking at each individual’s learning process. The diversity of projects created is often an indication that learners appropriated the concepts and developed their own ideas.
Part 3: Sharing and Reflecting

Assessment continued

Some educators find it helpful in planning curriculum to consider three aspects of learning: affective, cognitive, and technical. These are reflected in the goals of the workshop listed at the beginning of this guide: increasing interest and confidence; learning to program; and gaining experience using a motor.

You may also want to document your own reflections, including things you want to remember and improve next time. You may also want to ask participants for their suggestions of things they might change to improve the workshop for future participants.

Concepts integrated into the activity

The following are some of the concepts that are integrated into the workshop.

Math: Numbers can control length of time and number of repetitions.

Programming: Making a simple computer program involves putting together a sequence of steps that can repeat.

Design process: The basic design process involves coming up with an idea, creating and problem-solving, sharing and reflecting.

Creative thinking: You can come up with more than one way to solve a problem.

Engineering: Attaching parts is a major challenge in constructing objects.

Art: You can create a face with different expressions and character.

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Resources

**Motion Modules**

Find out how to build LEGO mechanisms to make creations move:
http://www.picocricket.com/motion.html

**PicoCricket Getting Started Guide**

The Getting Started Guide shows how to program, step-by-step, and offers tips on the last page:

**Organizing a Workshop**

Read additional suggestions for how to set up and run a workshop:
http://www.picocricket.com/organizing.html

**PicoCricket Troubleshooting Page**

Need help getting the PicoCricket to work? Visit the online Troubleshooting page:
http://www.picocricket.com/troubleshooting.html

**Workshop Themes**

Planning your next workshop? Browse a variety of themes for PicoCricket workshops:
http://www.picocricket.com/themes.html

**Educators**

Visit the PicoCricket Educators pages:
http://www.picocricket.com/educators.html