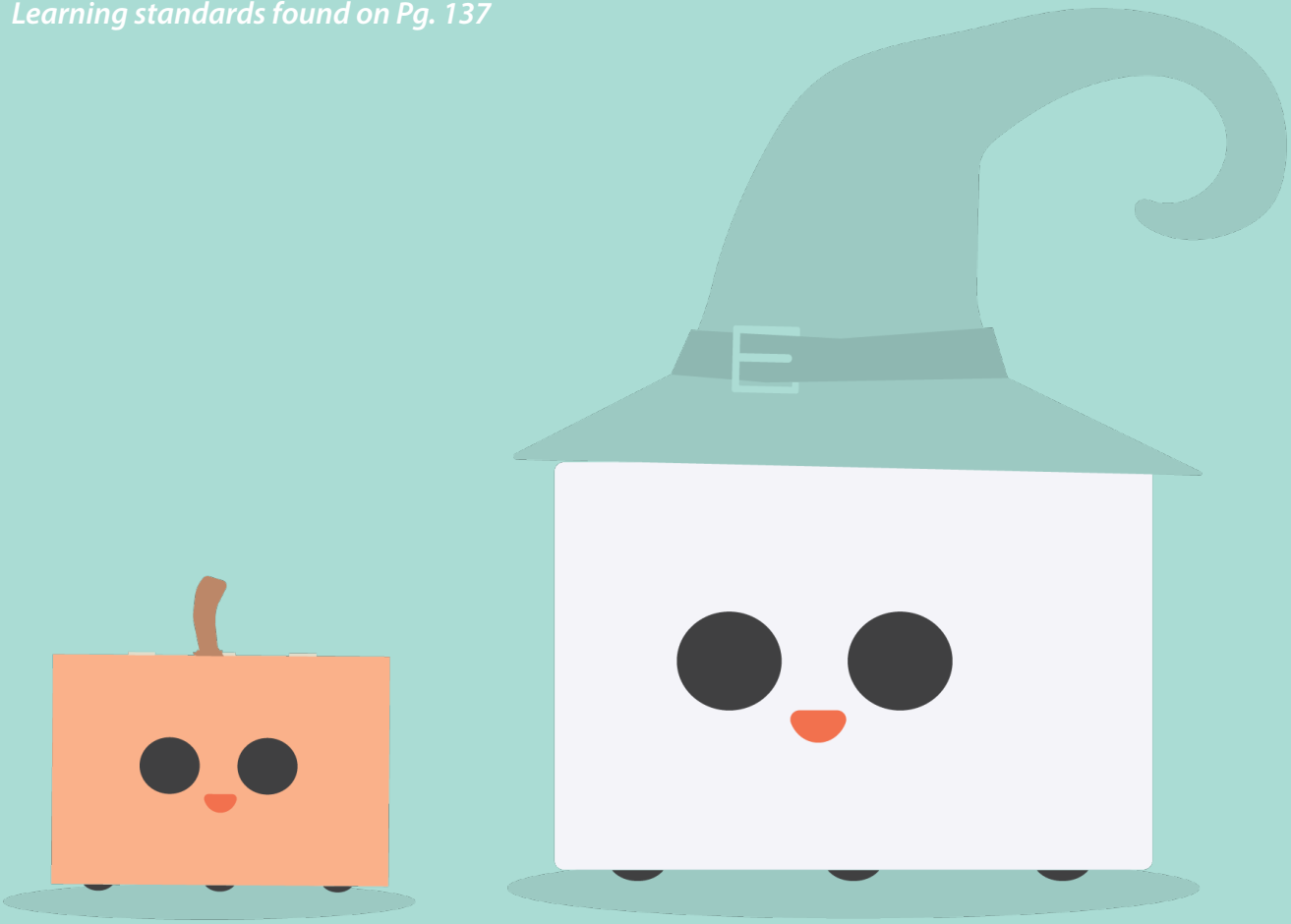
Costume Party

Lesson 01

Grades K - 3 *60 mins*

MatataBot makes a costume and brings a tune and dance moves to a costume party! Code and draw custom rectangular shells to wrap around MatataBot to create a spectacular costume. Then code a dance to your favourite tune and bring those moves to the party for a dance-a-thon.

Learning standards found on Pg. 137



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60 mins

Create student groups of 2 except where groups of 3 are required or beneficial to the student.
Groups will work on a flat surface - floor or table. Allow ample space for each group to work with their MatataBot set along with a drawing area.
Students groups should be placed considerately to allow students to walk back and forth to gather their materials.
Assign a designated area for the dance-a-thon.

Big ideas & essential questions

Students will experience a hands on geometric relationship between 2-D and 3-D objects. When they measure the circumference of MatataBot to customize the costume, they should conclude that unrolling the circumference of a circle, will result in the equivalent length of a line. They will also see that the side of a cylinder is a rolled up rectangle.

How can we create a custom fitted costume for MatataBot?
Considering standard and nonstandard units, how will you measure MatataBot to get a good fit? Students will be able to choose a unit of measure and apply their understanding of how to repeat the unit to measure around an object.

Measuring is an acquired skill that the students are still exploring and experiencing in a very direct way with this lesson.
Will the costume fit exactly once around MatataBot?
Which design did you choose and why: an overlapping costume or one that fits only partially around?
Due to MatataBot's unit length of a one second forward movement, students must decide if their costume design is best suited for a fit that is mostly around or have an overlap.

Learning outcomes

TSWBAT : the students will be able to:

1) Choose standard or nonstandard units to measure 3-D objects and 2-D shapes.
2) Recognize and apply the relationship between the properties of 3-D objects and 2-D shapes.
3) Code customized 2-D shapes to fit a 3-D object.
4) Code various movements to create a dance.

What you'll do

Each pair of students will investigate, measure and code together and will have MatataBot draw a custom rectangular shell that will wrap around MatataBot. Afterwards, they will decorate the costume by adding colour, legs, wheels, ears, other decorative materials, etc.. Choose the tune(s) that will be played at the dance-a-thon and have each group code a dance using animation movements and lights.

What you'll need

- Class set of Matatalab Pro Set and Animation Add-On set
- Markers for MatataBots
- Markers, stickers, glitter, stick-on gems, ribbons, etc for decorating
- Scissors
- Tape, glue
- Pencils
- Projector with tablet or computer
- Coloured construction paper or white copy paper for each group to create a costume shell
- Rulers
- String, pipe cleaners, twist ties for non-standard measurement of MatataBot circumference
- Prepare a sample costume for MatataBot that can easily be attached and detached from MatataBot

Prior to lesson

- MatataBots and Command Towers should be updated as per MatataBot Firmware Upgrade.
- Refer to User Guide for MatataBot and Command Tower on/off and connection instructions.
- Lay out MatataBot Pro and Animation add-on sets, and other materials so they are easily accessible for students. Set up projector with tablet or computer.
- During the dance-a-thon, have an extra "DJ" board & command tower in the stage area where students can add their own music code for spot light performances or you can have a class song that you co-create for everyone to dance to at the same time.

Introduction

5 mins

1) Your MatataBots have been invited to a costume party today! You will help MatataBot dress up in a fantastic costume and code some dance moves for a dance-a-thon!

2) Let's take a good look at MatataBot to decide how we can create a costume. Any ideas?

3) Let's take a look at the shape of it. What shape is MatataBot? What size is MatataBot?

   a) Use these questions and student input to direct them to figure out that the shape is a 3-D cylinder and to identify the 2-D shapes they see on MatataBot (a circle on top and bottom).

4) How can you find out MatataBot's size to create the costume? Can we use a ruler to measure around MatataBot?

5) What would be a good way to measure around MatataBot? Lead a brief discussion on non-standard units.

6) Do you think a ruler is a good measuring tool for this situation? It is a standard unit of measurement. What are the units on a ruler?

Guided practice

10 mins

1) Show the students your sample costume and how it attaches to MatataBot. Make the costume so that it can unravel to reveal its rectangular shape and relate the circumference to the length of the long rectangular side of the shell.

2) Once they figure out the size (length of the long and short side of the rectangle) that the shell should/can be, guide their discussion on how they would use the **Angle**, **Set Speed**, **Stop Wheel** and **Wait** blocks to code and draw it. **Angle** blocks will allow for simple coding of 90 degree turns.

3) Model and review the different **Set Speed**, **Stop the Right** / **Left Wheel** blocks along with **Wait** blocks and how to combine them with **Number** blocks (ask students about the relevance of these blocks) to vary the length of a line. The shortest length will have no **Number** blocks (one second), but the drawn line gets longer as you place a 2, 3, 4, or 5 **Number** block under the **Wait** block.

4) **You can also show the video clip How does it work Animation Add on... (series 2)** [1:38 - 3:35]
Youtube- *http://bit.ly/wait-blocks*

5) How can we shorten our coding sequence? Review **Loop Begins** / **Ends blocks** and find and use the core pattern in the code sequence.

6) Review how to use the **Right** / **Left LED Color blocks**:
How does it work Animation Add on... (series 3)
Youtube- *http://bit.ly/light-blocks-1*

Independent practice

35 mins

Challenge 1 *15 mins*

> Challenge the students to measure, using non-standard units, MatataBot's circumference and use that information to code MatataBot to draw a rectangular shell.

> Test the code without the marker at first to make sure the code is correct and that MatataBot does not drive off the paper.

> They should cut out and decorate the shell and can even add ears, accordion arms/legs, wheels, etc.

Challenge 2 *20 mins*

> It's time to create a dance but first they need to choose music! Students can choose a song, from the Pro set (Preset Music block),or the students can create their own song using the Melody blocks, Alto Clef Music blocks, and/or Treble Clef Music blocks.

> If they will be performing individually, they can take their board with their coded song and Command Tower to the DJ area to play their request as their MatataBot dances.

> If you will co-create one song for everyone to dance to, then have the music playing on the DJ Control Board while they code dance moves for the dance-a-thon.

> Have students add **Right** / **Left LED Color** blocks to show expression while MatataBot is dancing! Change the intensity of the light sequence by using **Number** blocks.

> Enjoy the dance-a-thon or individual spotlight performances!

Wrap up

5 mins

1) Students will carefully put away all MatataBot components and other materials.

2) Ask the following questions:

   > What tool did you use to measure MatataBot's circumference?

   > What did you do with that information?

   > How did you code the costume shell/rectangle?

   > What was difficult about this project?

   > What was your favourite dance move?

Interdisciplinary & 21st century connections

This lesson can be used in Mathematics to help teach topics within Geometry and Spatial sense (relating properties of 2-D figures to 3-D objects) as well as Science and Technology. This lesson could also be co-taught with another content area teacher.

21st Century Skills include:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Technology literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social Skills

Modifications

For younger students, co-create coding of the rectangle shell and keep coding model available for students to copy and implement.

Students can use the square artist warm-up card and the **Directional** blocks from the Pro set to help them get started on coding the rectangle.

Accommodations

- Pair student heterogeneously to optimize co-teaching of prior knowledge.
- Place student in a group of 3.
- Allow student to work alone and independently experiment with animation blocks or the artist warm-up card.
- Student can code the song for the dance-a-thon or choose the song for the individual dance for their group.

Extension activities:

- Add another shape to the basic rectangular shell such as a triangle, circle, star, or students can create their own shape. Create a stage area for the dance-a-thon.

Supporting files & links

Wait Blocks, How does it work Animation Add on...(series 2) [1:38 - 3:35]
Youtube- *http://bit.ly/wait-blocks*

Light Blocks, How does it work Animation Add on...(series 3)
Youtube- *http://bit.ly/light-blocks-1*

Teaching Big Ideas in Math, Marion Small
Document- *http://bit.ly/big-ideas-1*

Guides to Effective Instruction in Mathematics Grades 1 to 3
Document- *http://bit.ly/math-guide-1-to-3*

Erikson Institute Early Math Collaborative, Big Ideas
Website- *http://bit.ly/early-learning-erikson*

Firmware Upgrade:
Matatalab- *http://bit.ly/upgrade-firmware*

Set Wheel Blocks, Drawing Circles, How does it work Animation Add on... (series 1)
Youtube- *http://bit.ly/set-wheel-blocks*

Assessment

Student's work will be assessed in the following manner:

- Students are able to identify the critical thinking involved in determining how to measure the circumference of the MatataBot using non-standard units.
- Students are able to identify, using sufficient evidence of understanding and knowledge, the translation of the circumference of a cylinder to the length of the side of a rectangle.
- Students are able to identify, using mathematical vocabulary, the 2-D faces on 3-D objects.
- Students are able to communicate sufficient understanding and knowledge of their coding logic to create 2-D shapes.
- Students collaborated successfully with their partner(s) to complete the costume shell and dance.

Category/Level Criteria	*Level 1 Poor performance*	*Level 2 Needs improvement*	*Level 3 Adequate*	*Level 4 Excellent*
Computational Thinking	Demonstrates limited ability to: • Break a complex problem down into smaller problems. (Decomposition) • Create a simple set of steps to solve the problem. (Algorithms) • Describe the solution and apply lessons to future solutions. (Abstraction)	Demonstrates some ability to: • Break a complex problem down into smaller problems. (Decomposition) • Create a simple set of steps to solve the problem. (Algorithms) • Describe the solution and apply lessons to future solutions. (Abstraction)	Demonstrates considerable ability to: • Break a complex problem down into smaller problems. (Decomposition) • Create a simple set of steps to solve the problem. (Algorithms) • Describe the solution and apply lessons to future solutions. (Abstraction)	Demonstrates exceptional ability to: • Break a complex problem down into smaller problems. (Decomposition) • Create a simple set of steps to solve the problem. (Algorithms) • Describe the solution and apply lessons to future solutions. (Abstraction)
Communication	Demonstrates limited ability to: • Share thoughts and ideas with co-workers in order to solve problems. • Share with the teacher their learning through explanation and demonstration.	Demonstrates some ability to: • Share thoughts and ideas with co-workers in order to solve problems. • Share with the teacher their learning through explanation and demonstration.	Demonstrates considerable ability to: • Share thoughts and ideas with co-workers in order to solve problems. • Share with the teacher their learning through explanation and demonstration.	Demonstrates exceptional ability to: • Share thoughts and ideas with co-workers in order to solve problems. • Share with the teacher their learning through explanation and demonstration.
Collaboration	Demonstrates limited ability to: • Work with other group members. • Share materials, devices, and time appropriately. • Complete tasks in a group due to disruptive behavior.	Demonstrates some ability to: • Work with other group members. • Share materials, devices, and time appropriately. • Complete tasks in a group (some disruptive behavior).	Demonstrates considerable ability to: • Work with other group members. • Share materials, devices, and time appropriately. • Complete tasks in a group • Friendly and is somewhat a leader.	Demonstrates exceptional ability to: • Work with other group members. • Share materials, devices, and time appropriately. • Complete tasks in a group • Extremely friendly and acts as a leader.
Coding challenges	Demonstrates limited ability to: • Complete identified coding challenges. • Stay on task (cannot stay on task). • Complete extension activities as time permits.	Demonstrates some ability to: • Complete identified coding challenges. • Stay on task most of the time. • Complete extension activities as time permits.	Demonstrates considerable ability to: • Complete identified coding challenges. • Stay on task • Complete extension activities as time permits. • Find other ways to complete challenges.	Demonstrates exceptional ability to: • Complete identified coding challenges. • Stay on task • Complete extension activities as time permits. • Find other ways to complete challenges. • Going over and beyond, creatively, in completing challenges.
Independent Practice	Demonstrates limited ability to: • Work with their partner (very disruptive behaviour). • Stay focused on completing tasks (cannot focus).	Demonstrates some ability to: • Work with their partner (some disruptive behaviour). • Stay focused on completing tasks (some focus).	Demonstrates considerable ability to: • Work with their partner (little disruptive behaviour). • Focus on completing tasks. Somewhat engaged in tasks.	Demonstrates exceptional ability to: • Work with their partner (no disruptive behaviour). • Focus on completing tasks. Fully engaged in tasks.