

# Teacher Resource Guide

## Cyberchase: The Chase Is On!™

Imagine It! The Children's Museum of Atlanta  
February 13, 2010 – June 6, 2010



Dear Educator,

We are delighted to welcome your class to Imagine It! The Children's Museum of Atlanta! Through the world of *Cyberchase: The Chase is On!*<sup>TM</sup> educators can provide challenging mathematical and problem solving experiences to inspire your students' imagination. The exhibit offers many chances for your class to meet zany characters in a fun, kid friendly environment, while approaching math with a "can do" attitude. Using everyday math experiences as well as critical thinking skills, your students will develop self confidence that will carry over into other mathematical environments.

As educators, we strive to encourage young children as they learn about math. *Cyberchase: The Chase is On!* will stimulate the minds of your students and excite them about practicing critical thinking skills.

Sincerely,

Karen M. Kelly  
Director of Exhibits and Education

The mission of Imagine It! The Children's Museum of Atlanta is to spark imagination and inspire discovery and learning for all children through the power of play.

*Cyberchase: The Chase is On!*<sup>TM</sup> was created by the Children's Museum of Houston in association with Title Entertainment, Inc. and WNET.ORG, with major funding from the National Science Foundation. The exhibit is sponsored in Atlanta by Publix Super Markets Charities with additional support from State Street Global Advisors. Major funding for imagine It! is provided by the Fulton County Board of Commissioners under the guidance of the Fulton County Arts Council.



This Resource Guide may be reproduced for classroom use only.

Imagine It! The Children's Museum of Atlanta  
275 Centennial Olympic Park Drive NW  
Atlanta, GA 30313  
404.659.KIDS (5437) [www.childrensmuseumatlanta.org](http://www.childrensmuseumatlanta.org)  
Mon – Fri: 10 a.m. – 4 p.m.; Sat – Sun: 10 a.m. – 5 p.m.

## UNIT STRUCTURE AND CONCEPTS

*Imagine It! The Children's Museum of Atlanta* brings *Cyberchase: The Chase is On!*<sup>TM</sup> to Atlanta students for an exploration of math activity, learning and fun! Use this resource guide to supplement your lesson plans and prepare your class for their field trip to *Imagine It!* Upon arrival, our troupe of "Imaginators" will greet your group and facilitate your learning experience.

Your class will explore the *Cyberchase* exhibit and find endless opportunities to explore math. Students will find that math does not only consist of numbers, but also includes skills like understanding shapes and spaces, realizing when a game is fair or not, understanding patterns, finding missing pieces to a puzzle, and, of course, measurement of all types.

Based on the Emmy winning PBS KIDS GO! math mystery cartoon *Cyberchase*, this exhibit will teach children to use their best weapon: Brain Power, to defeat the villainous Hacker and in everyday problem solving as well. Enjoy working with your students as they zoom into the out-of-this-world, educational exhibit *Cyberchase: The Chase is On!*<sup>TM</sup>

### **And Of Course ..... We Support State Standards!**

Front and center in the following Lesson Supplement pages is the information you need to indicate which grade level requirements your class is fulfilling with their field trip to *Imagine It! The Children's Museum of Atlanta!* Please feel free to contact Tawana Francisco, Education Coordinator, for additional information that may help you as you plan your visit, at 404-527-5967 or [tawana.francisco@imagineit-cma.org](mailto:tawana.francisco@imagineit-cma.org).

# LESSON PLAN SUPPLEMENTS

## 1. The Poddleville Case: Patterns

### Pre-Kindergarten

#### Mathematical Development

- MD 2 Children will create and duplicate simple patterns
- Copies a pattern using sounds or physical movements
  - Recognizes and reproduces simple patterns of objects
  - Reproduces and extends a pattern using objects
  - Independently creates patterns using objects
  - Spontaneously recognizes and identifies patterns in the environment

### Kindergarten

#### Mathematics

##### Geometry

- MKG3 Students will identify, create, extend, and transfer patterns from one representation to another using actions, objects and geometric shapes
- Identify a missing shape within a given pattern of geometric shapes
  - Extend a given pattern, and recognize similarities (such as color, shape, texture, or number) in different patterns

### First Grade

#### Mathematics

##### Process Standards

- M1P5 Students will represent mathematics in multiple ways
- Create and use representations to organize, record, and communicate mathematical ideas
  - Select, apply, and translate among mathematical representations to solve problems

### Second Grade

#### Mathematics

##### Process Standards

- M2P5 Students will represent mathematics in multiple ways
- Create and use representations to organize, record, and communicate mathematical ideas
  - Select, apply, and translate among mathematical representations to solve problems

### Third Grade

#### Mathematics

##### Process Standards

- M3P5 Students will represent mathematics in multiple ways
- Create and use representations to organize, record, and communicate mathematical ideas.
  - Select, apply, and translate among mathematical representations to solve problems.

## Activities: Solve the Case with Patterns!

1. Provide pipe cleaners and beads of different colors for your students. Ask your students to start with 4 beads, of at least 2 colors, and string into a pattern. They can repeat this and make the beaded pipe cleaner into a bracelet, bookmark, keychain or other decoration!
2. Ask one child to lead a game of repeating patterns. He can start with two notes and see if a student can repeat it, go to three notes and see if the next student can repeat that, then 4 notes, etc. Children can also use clapping and stomping, making the game more complicated for older children. See how far the game can go without making a mistake!
3. Take a walk around the school and see how many patterns your class can spot: tile floors, pictures hung in a corridor, different color bricks on the outside of the building, etc.
4. Students can make a miniature “quilt” using cut pieces of wallpaper and a larger piece of wallpaper for the background. Precut for younger children diamond, square, rectangle, shapes and strips out of old wallpaper books. Older children can do this on their own. As the children glue their patterns onto the larger sheet of wallpaper, they are making patterns with both the positive and negative spaces as well as with both shapes and colors.
5. It’s a great time of year to fold and cut snowflakes for your students to see symmetrical patterns. Fold a square piece of paper in half into a triangle, then a second time, and finally a third time. Children can cut small shapes all the way around the 3 sides of the triangle. Open, and viola! A gorgeous symmetrically patterned snowflake!

## More Resources

**Websites\*:** Clip featuring the Stomp group and musical patterns:

[http://pbskids.org/cyberchase/forreal/107\\_for\\_real\\_hi.html](http://pbskids.org/cyberchase/forreal/107_for_real_hi.html)

✓ Create musical patterns with this online interactive Cyber Pattern Player:

<http://pbskids.org/cyberchase/games/patterns/index.html>

✓ Free lesson plan: Patterns to the Rescue Cyberchase Activity:

<http://pbskids.org/cyberchase/parentsteachers/lessons/lessonplans/lesson4.html>

**\*To play the “Cyberchase for Real” clips you will need to download Real Player**

## Books

✓ Beep Beep, Vroom Vroom! By Stuart Murphy

✓ Dinosaur Deals by Stuart Murphy

✓ Pattern by Henry Pluckrose

✓ Safari Park by Stuart Murphy

✓ Twizzlers: Shapes and Patterns by Jerry Pallotta

## 2. Eureka: Geometry

### Pre-Kindergarten

#### Mathematical Development

- MD 4 Children will develop a sense of space and an understanding of basic geometric Shapes
- Recognizes, describes and compares basic geometric shapes
  - Uses classroom materials to create shapes
  - Uses language to indicate where things are in space: positions, directions, distances, order

### Kindergarten

#### Mathematics

#### Geometry

- MKG1 Students will correctly name simple two and three-dimensional figures, and recognize them in the environment
- Recognize and name the following basic two-dimensional figures: triangles, rectangles, squares, and circles
  - (activities do not support this Georgia Performance Standard)
  - Observe concrete objects in the environment and represent the objects using basic shapes, such as drawing a representation of a house using a square together with a triangle for the roof
  - Combine basic shapes into basic and more complicated shapes, and will decompose basic shapes into combinations of basic shapes
  - Compare geometric shapes and identify similarities and differences of the following two and three-dimensional shapes: triangles, rectangles, squares, circles, spheres, and cubes

### First Grade

#### Mathematics

#### Geometry

- M1G1 Students will study and create various two and three-dimensional figures and identify basic figures (squares, circles, triangles, and rectangles) within them
- Build, draw, name, and describe triangles, rectangles, pentagons, and hexagons
  - Build, represent, name, and describe cylinders, cones, and rectangular prisms (objects that have the shape of a box)
  - Create pictures and designs using shapes, including overlapping shapes
- M1G2 Students will compare, contrast, and /or classify geometric shapes by the common attributes of position, shape, size, number of sides, and number of corners

### Second Grade

#### Mathematics

#### Geometry

- M2G1 Students will describe and classify plane figures (triangle, square, rectangle, trapezoid, quadrilateral, pentagon, hexagon, and irregular polygonal shapes) according to the number of edges and vertices and the sizes of angles (right angle, obtuse, acute)
- M2G2 Students will describe and classify solid geometric figures (prisms, cylinders, cones, and spheres) according to such things as the number of edges and vertices and the number and shape of faces and angles
- Recognize the (plane) shapes of the faces of a geometric solid and count the number of faces of each type
  - Recognize the shape of an angle as a right angle, an obtuse or acute angle.
- M2G3 Students will describe the change in attributes as two and three-dimensional shapes are cut and rearranged.

### Third Grade

#### Mathematics

#### Geometry

- M3G1 Students will further develop their understanding of characteristics of previously studied geometric figures.
- Draw and classify previously learned fundamental geometric figures and scalene, isosceles, and equilateral triangles.
  - Identify and compare the properties of fundamental geometric figures.
  - Examine and compare angles of fundamental geometric figures.

## Activities: Geometric Math Mysteries!

1. Divide children into groups of 4. Provide each group with a bag of different shapes. (for older children, making sure to include scalene/isosceles/equilateral triangles, cylinders, trapezoid, quadrilateral, pentagon, hexagon, and irregular polygonal shapes) The leader chooses a shape, keeping it hidden. Now the leader describes the shape to the other children (number of sides or number of corners, and for older children the number of edges, vertices and sizes of angles – right, obtuse, acute). Whoever draws the correct shape and calls out the name first gets to be leader next!
2. Check out the Tangram activity on the Cyberchase website or make your own with the shapes needed. Students can try this on the computer or with tangram shapes you have provided. <http://pbskids.org/cyberchase/games/area/>
3. Children can organize areas of the classroom using geometric shapes and spaces to do the trick! In the closet or bookcase, children can fit items in spaces that work well for something of that specific size and shape. Students can sort items first, such as all books of a certain size, boxes, etc.
4. Pull out the blocks for your class! Ask children to use the geometric shapes to make “real” objects and then tell a story to their partner, using the words for the shapes used. For instance, a house with a cube, a train using cylinders for wheels, etc.)

## More Resources

### Websites

- ✓ Geometry For Real: A short real life clip featuring Harry as he uses 2-D shapes to make a 3-D solid:  
[http://pbskids.org/cyberchase/forreal/113\\_for\\_real.html](http://pbskids.org/cyberchase/forreal/113_for_real.html)
- ✓ Create nets of various solids with this online printable activity:  
<http://pbskids.org/cyberchase/games/23dgeometry/index.html>
- ✓ Free lesson plan: Boxed In CYBERCHASE Activity (2-D shapes to 3-D boxes)  
<http://pbskids.org/cyberchase/parentsteachers/lessons/lessonplans/lesson7.html>

### Books

- ✓ A Fishy Shape Story by Joanne Wylie
- ✓ Calico Cat Looks at Shapes by Don Charles
- ✓ Captain Invincible and the Space Shapes by Stuart Murphy
- ✓ The Greedy Triangle by Marilyn Burns
- ✓ Twizzlers Shapes and Geometry Book by Jerry Pallotta

### 3. EcoHavenCSE: Measurement

#### Pre-Kindergarten

##### Mathematical Development

- MD 5 Children will learn how to use a variety of non-standard and standard means of Measurement
- (activities do not support this GPS)
  - Uses mathematical language to describe experiences involving measurement
  - (activities do not support this GPS)
  - Measures the length of objects using non-standard or standard measures
  - Measures the volume capacity) of objects using non-standard or standard measures

#### Kindergarten

##### Mathematics

##### Measurement

- MKM1 Students will group objects according to common properties such as longer/shorter, more/less, taller/shorter, and heavier/lighter.
- Compare and order objects on the basis of length
  - Compare and order objects on the basis of capacity
  - Compare and order objects on the basis of height

#### First Grade

##### Mathematics

##### Geometry

- M1M1 Students will compare and/or order the length, weight, or capacity of two or more objects by using direct comparison or a nonstandard unit.
- Directly compare length, weight, and capacity of concrete objects
  - Estimate and measure using a non-standard unit that is smaller than the object to be measured

#### Second Grade

##### Mathematics

##### Geometry

- M2M1 Students will know the standard units of inch, foot, yard, and metric units of centimeter and meter and measure length to the nearest inch or centimeter
- Compare the relationship of one unit to another by measuring objects twice using different units each time
  - Estimate lengths, and then measure to determine if estimations were reasonable
  - Determine an appropriate tool and unit for measuring

#### Third Grade

##### Mathematics

##### Geometry

- M3M2 Students will measure length choosing appropriate units and tools
- (activities do not supported this GPS)
  - Measure to the nearest  $\frac{1}{4}$  inch,  $\frac{1}{2}$  inch and millimeter (mm) in addition to the previously learned inch, foot, yard, centimeter, and meter
  - Estimate length and represent it using appropriate units
  - Compare one unit to another within a single system of measurement

## Activities: Measure and Explore!

1. Match each student with a partner and provide them with a piece of string longer than their body.
  - a. Ask them to hold one end of the string at the top of their head and let their partner pull it straight down to the floor and cut the string. Tell the children this is their height string.
  - b. Next, ask them to guess how many times this string will wrap around their head. They should record their guess and then check their guess with the string. How many times do they think the string will go around a grown-up's head? Make a guess and then check that guess.
  - c. Ask the kids if they think their height is longer or shorter than their arm span? They can open their arms wide and measure finger tip to finger tip to find arm span. Again, they can record the guess and check it. Ask the students what similarities they find between height and circumference of their head. Is it true for most people? Some people say that if your height matches your arm span you are a square. Why would they say that? What would you call someone whose arm span is shorter or longer than their height?
  - d. The children can then find other similarities between body parts. Can they find a length that is the same length as their foot? (from elbow to wrist) Let the students compare their height string to other objects such as tables, chairs, doors, etc.
  - e. And last, have the students help each other measure all of the parts of the body and objects again using a ruler or yardstick, record those measurements. Older children should measure using metric units as well, and can compare the numbers from the different units by recording all of this on their sheets.
2. Divide the students into groups of 4.
  - a. Provide each group with 4 small plastic jars of different shapes and/or volumes, a large container of beads, beans or jewels, a scooper and a scale. With pencil and paper, ask the children to record their estimates of how many beads can be scooped with one scoop and then check their estimate by counting, and record that number.
  - b. Now do the same with the different jars. Which jar will hold the most? Students can count and then weigh each container. (After weighing the first container, they can estimate the weight of all the other containers and check their estimates with the scale.) Do any of the jars hold equal amounts? How could a calculator help? How did they figure out their estimate? Are there other ways to estimate?
3. As a class, see how many items in the classroom the students can name that are used for measuring (clock, thermometer, yardstick, etc.). Make a list and note beside them what they measure. How often do the students use these items?
4. Again in small groups, the students can use a measuring cup to make their own play dough. They can measure and mix  $1\frac{1}{2}$  C flour,  $\frac{1}{2}$  C salt,  $\frac{1}{4}$  C water,  $\frac{1}{4}$  C vegetable oil. Next, they can use measuring spoons to add food coloring to parts of the dough. Encourage them to try different amounts using different spoons and see how it changes the color intensity of the play dough.

## More Resources

### Websites

- ✓ Measurement For Real: A short real life clip featuring Harry as he uses measurement and proportions to wow an audience:  
[http://pbskids.org/cyberchase/forreal/301\\_for\\_real.html](http://pbskids.org/cyberchase/forreal/301_for_real.html)
- ✓ Use clues and measurement to find the height of various creatures:  
<http://pbskids.org/cyberchase/games/bodymath/index.html>
- ✓ Free lesson Plan: Body Math CYBERCHASE Activity:  
[http://pbskids.org/cyberchase/parentsteachers/lessons/pdf/finlit6\\_vdr\\_bodymath.pdf](http://pbskids.org/cyberchase/parentsteachers/lessons/pdf/finlit6_vdr_bodymath.pdf)

### Books

- ✓ Counting on Frank by Rod Clement
- ✓ If You Hopped Like a Frog by David Schwartz
- ✓ Super Sand Castle Saturday by Stuart Murphy
- ✓ The Hershey's Milk Chocolate Book of Weights and Measures by Jerry Pallotta

## MORE MATH RESOURCES

---

### More Websites !

[www.pbskids.org/cyberchase](http://www.pbskids.org/cyberchase)

PBS website with more fun and learning from the show!

[www.funbrain.com/brain/MathBrain/MathBrain.html](http://www.funbrain.com/brain/MathBrain/MathBrain.html)

[www.primarygames.com/math.html](http://www.primarygames.com/math.html)

These websites are packed with math games that will challenge your child's brain power!

[www.athomewithmath.terc.edu/mathkits.html](http://www.athomewithmath.terc.edu/mathkits.html)

[www.mixinginmath.terc.edu/](http://www.mixinginmath.terc.edu/)

Packed with a variety of math games and activities for any age!

[www.ed.gov/parents/academic/help/math/math.pdf](http://www.ed.gov/parents/academic/help/math/math.pdf)

Create learning experiences out of everyday materials and routines!

### More Books!

All of these books are available through Atlanta Fulton Public Libraries and some can be purchased in our Museum store, Imagine It! To Go.

***Pigs at Odds*** by Amy Axelrod

***Little Numbers*** by Edward Packard

***Give Me Half!*** by Stuart Murphy

***Jump, Kangaroo, Jump!*** by Stuart Murphy

***How Much is a Million?*** by David Schwartz

***Math Curse*** by John Scieszka

***Max Counts his Chickens*** by Rosemary Wells

***My Numbers in Spanish/Mis numeros en espanol*** by Zakiyyah

(Provided by Dana Lily, Ph. D., Mercer University)

## **Cyberchase: The Chase Is On!™ Advisory Committee**

**Rosalind Barnes**

Partnership for Reform in Science & Math (PRISM)

**Shondra Carter**

Institute Partnerships/Georgia Tech

**Liz Dolan**

Learning Specialist/Forward Thinking Consulting

**Caitlin Dooley**

Assistant Professor of Early Childhood Education  
Georgia State University/College of Education

**Scott Depoy**

Actor/Educator

**Lesley Hollenbeck**

Producer/Community Volunteer

**Dana Lilly**

Professor of Early Childhood Education  
Mercer University

**Ann Marie McGaughey**

McKenna Long Aldridge/Imagine It! Board Member

**Barbara Naylor Hill**

Senior Vice President  
Junior Achievement

**Marilyn Stansbury**

Director of Education  
Georgia Public Broadcasting

**Megan Welch**

Georgia Public Broadcasting

**Brian Williams**

Assistant Professor of Science  
Georgia State University/College of Early Childhood Education

**Donna Whiting**

Center for Education Integrating Science, Mathematics, and Computing (CEISMC)