Children's Museum of Houston

Pre/Post Classroom Activities

Nets

Rationale

It is the classic good vs. evil adventure as the dastardly Hacker attempts to overtake CyberSpace, but is continuously outsmarted by three curious kids and one cyberbird pal determined to stop him. Join forces with the CyberSquad, Matt, Inez, Jackie and Digit, in their quest to save CyberSpace as they zoom into ***Cyberchase – The Chase Is On!***, an out-of-this-world, educational mathematics exhibit.

In this exhibit, children will enter CyberSpace through a special portal to explore favorite cybersites, including the *Control Central*, the *Grim Wreaker* and *Poddleville*. They will help the CyberSquad protect the virtual universe from the villainous Hacker while exploring math concepts such as place value, algebra, geometry, fractions and probability.

In this geometry activity, students will create 3-D boxes from a 2-D net and examine their relationships. Students can examine simple or complex nets depending on their grade level. In the Cyberchase exhibit, students will use geometric shapes to create three dimensional solids. This basic review of shapes will help students create a connection from the individual shapes, to a net (a flat shape that can be folded into a 3-D solid), and finally to the completed solid.

TEKS Objectives

V.C.1 (PreK): Child names common shapes.
V.C.2 (PreK): Child creates shapes.
K.8: The student uses attributes to determine how objects are alike and different.
K.9: The student recognizes attributes of two- and three-dimensional geometric figures.
1.6, 2.7: The student uses attributes to identify two- and three-dimensional geometric figures. The student compares and contrasts two- and three-dimensional geometric figures or both.
3.8: The student uses formal geometric vocabulary.
4.8: The student identifies and describes attributes of geometric figures using formal geometric language.
5.7: The student generates geometric definitions using critical attributes.

Vocabulary

Net – a flat shape that can be folded into a 3-D solid.

Your vocabulary for this activity will vary depending on the grade level and degree of difficulty desired but may include squares and cubes; triangles and triangular prisms, rectangles and rectangular prisms, etc.

Background
According to the NCTM Curriculum Focal Points, children interpret the physical world with geometric ideas (e.g. shape, orientation, spatial relations) and describe it with the appropriate vocabulary. They should be able to identify, name, and describe a variety of shapes and solids. They use basic shapes and spatial reasoning to model objects in their environment and to construct more complex shapes. This activity is another way to practice visualizing various shapes and identifying various attributes or different solids. This activity is adaptable to various ages. Younger children can focus on basic shapes like squares and triangles, where older children can focus on more difficult shapes.

Materials
- Copies of nets
- Tape
- Scissors
- Empty boxes

Procedure
Set Up: This activity will take place over one class period and works best in small groups of 3-4 students. Set out materials and one bag of shapes per group for each group.

1. Look at a net to determine if it will make a closed box, an open box (box with no lid) or no box at all.
2. Cut out the net, fold it and tape it closed to check you guess.
3. Now try another one.
4. Take apart one of the boxes to look at the net. What do you notice about the different nets and boxes?

Questions to ask
- Does the net look like what you would expect?
- How can you tell if a net will make an open or closed box?
- How can you tell if a net cannot be made into a box?
- Which nets make the same shaped box?
- Can a box be made with all triangle pieces?

Extensions
Use the shapes to design your own net. How can you make sure that your net will fold up into a box?

Go in reverse—find a shape or box and make some nets that will fold up into the shape.

Try more advanced nets that include more than one shape. Bring boxes from home (cereal boxes, tissue boxes, etc.) and take them apart to examine the net.

Resources
- 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
- Create nets of various solids 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
- *Cubes, Cones and Cylinders* by Tana Hoban. A wordless picture book of shapes found in the objects all around us.

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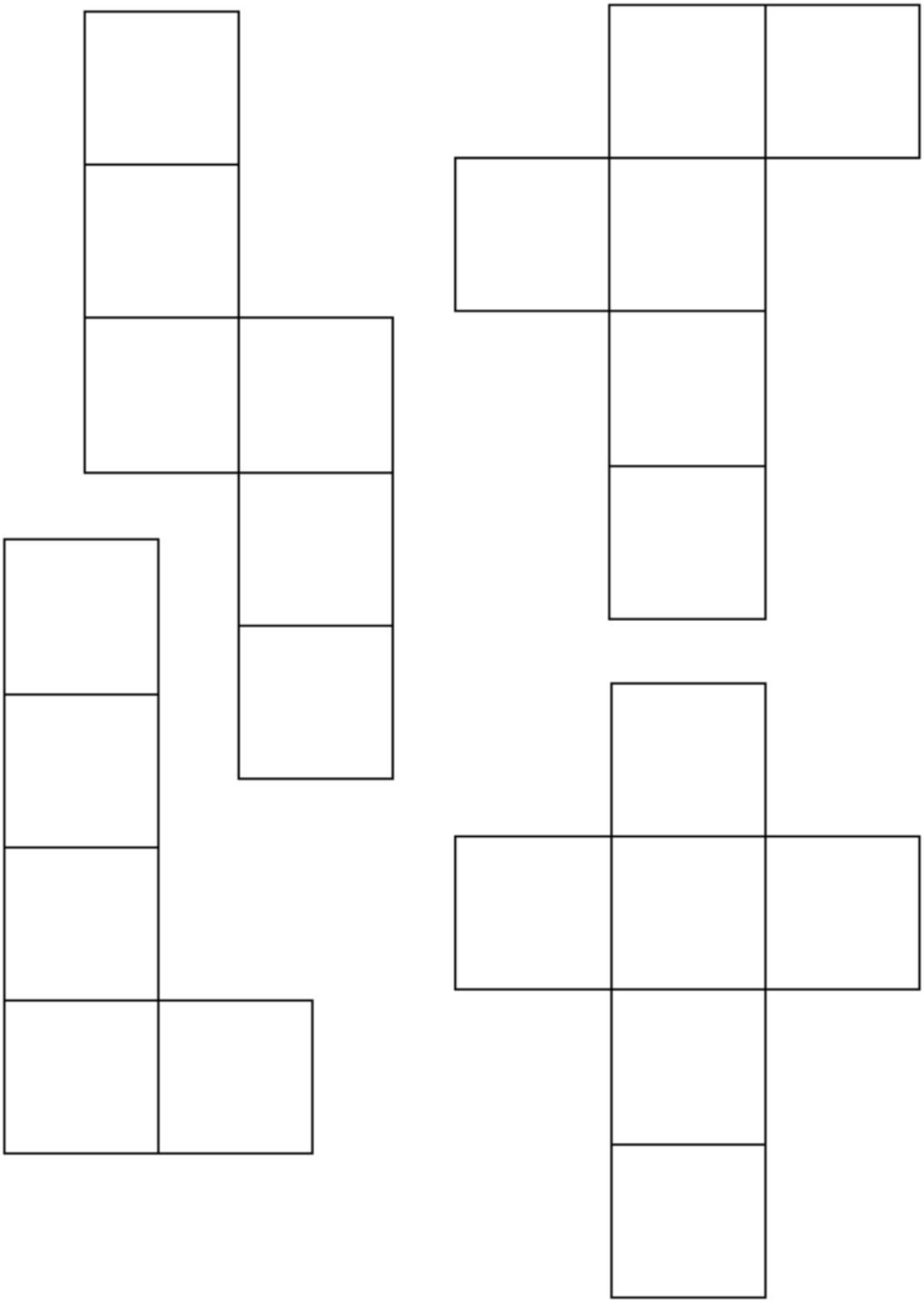

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