

## Mathematized Centers

### 1. Manipulatives & Table Toys

**Domain:** Data/Graphing

**Focus Skill:** Students will sort items and create a graph of the results; they will make observations about their graph regarding amounts of most/least, more/less, and same.

**Materials:**

- Sorting materials (counters, pompoms, buttons, erasers, stickers, crayons, cards, etc)
- Small bags
- Blank graphing sheet or recording sheet

**Directions:**

1. Put 2-3 handfuls of a sorting material into a bag. Make 2-3 bags with different materials (1 with dino counters, 1 with pompoms, 1 with erasers).
2. Have students reach into a bag of their choice and grab a handful of items.
3. Ask students to decide how they want to sort their items (size, color, type, other attribute).
4. Once the student has formed groups, let them “graph” using their items.
5. After items are grouped, ask questions such as: “Which category has the most? Least?” “Do any categories have zero items?” “Do any of them have the same amount of items?”
  - ☞ Possible student answers: “I had no yellow dinosaurs.” “I have the same number of planes as firetrucks.” “I have 2 more sparkly stickers than plain stickers.”

**Extensions:**

- After the sorting, graphing, and discussion, some students may wish to create a representational recording of their graph by coloring in the amounts on a blank graph. Take annotations of their observations as they tell you about the graph.
- Ask students if there’s another way they can sort the same group of items.
- Adjust materials to match a season or theme.

**Note:** Notice how powerful choice is in this activity. Students choose the item to sort and *how* they want to sort it.

[illegible]

## 2. Blocks

**Domain:** Counting & Cardinality

**Focus Skill:** Students will subitize, count with one-to-one correspondence, practice cardinality, and compare amounts.

**Materials:**

- Variety of building materials (small unit blocks, unifix cubes, Froogz, Magformers, cups)
- Recording sheet

**Directions:**

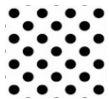







1. (If working with partners) Have two students build a design using the same building material. Set a timer for 1 minute.
2. At the end of the minute, prompt children to make comparisons between their designs. Ask prompting questions such as:  
“How many red blocks did you use?” “Who had more of the long blocks?”  
☞ A common progression would be for students to count or subitize: “I have 2 red blocks. You have 3 red blocks.”  
Then, compare: “You have more red blocks than I do.” Then, elaborate: “3 is more than 2. You have 1 more red block than me.”

**Extensions:**

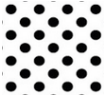







- Have students record their amounts on a recording sheet and circle who had more or less of a certain item.

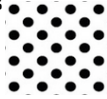

**Note:** This activity could be done independently or with a partner. If a child works independently, the teacher could help prompt with questions or the child could create two designs to compare.

**Note:** The timer simply serves as an indication of when building should stop so comparisons can be made. You can adjust the length or not use the timer if you prefer.

(Person 1)	Who has more? 	(Person 2)	(Person 1)	Who has less? 	(Person 2)
					
					
					



	Who has more? 			Who has less? 	
	 Triangular Prism			 Cylinder	
	 Prism			 Long Rectangular Prism	
	 Arch			 Curve	

	Who has more? 			Who has less? 	

### 3. Literacy/Library

**Domain:** Counting & Cardinality

**Focus Skill:** Students will explore counting concepts such as counting forward and backward within 10.

**Materials:**

- Counting books such as:
  - *Pete the Cat and His Four Groovy Buttons*
  - *Over in the Meadow*
  - *Ten in the Bed*
  - *Five Green and Speckled Frogs*
  - *Five Little Monkeys*
  - *Doggies* (Sandra Boynton)
  - *Opposites* (Sandra Boynton)
- Finger puppets or flannel boards


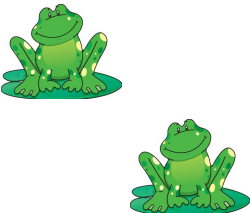
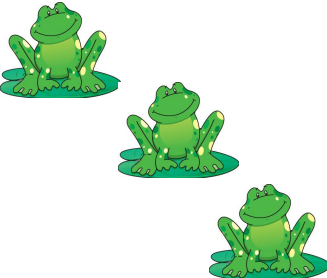
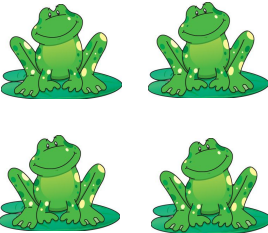
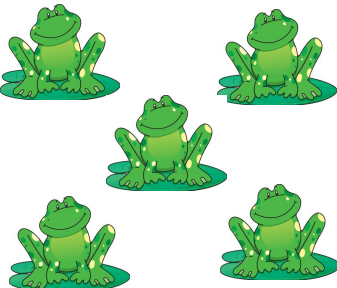
**Directions:**

1. Allow children to choose a familiar story book to read.
2. Have students re-enact the story using finger puppets, acting out with flannel board pieces, or with classmates.
3. Pair the numbers in the books with a number path that is displayed nearby. (For example, for *Five Green and Speckled Frogs*, use images of the frogs and create a number path with one frog under “1”, two frogs under “2”, etc.)

**Extensions:**

- Have children work on composing numbers by using the illustrations. For example, if there are 5 frogs and 3 are in the water, how many are on land? What if 4 are in the water?
- Have children to create their own books that count forward or backward.
- Have *children* create a “Numbers Book” where they find different representation of each number to add to the correct page. For example, on the number 1 page, glue pictures of 1 flower, 1 toothbrush, 1 dot in a ten frame, 1 finger, etc.

**Note:** This particular example is for counting and cardinality, but the book selection could be changed for different mathematical skills or topics.

1	2	3	4	5
				





#### 4. Games

##### **Materials:**

- SET (see modifications below)
- SET Jr.
- Swish (directions included in game)
- Tiny Polka Dot (several different game modes included in game)
- Mental Blox (visual cards show what to build and ask a question on how to modify based on attributes)
- Blink

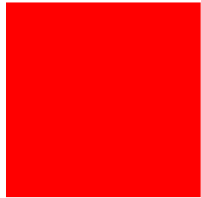
##### **Directions:**

1. Take some time to explore these games. While these are games that are available for purchase, there may be some ideas you can take and generate your own games with.

##### **Ways to modify SET:**

- Utilize the attribute cards (color, shape, shading, and amount) to have student identify all four attributes of their selected card.
- Have students select 2 cards. After identifying attributes of each card, ask them to compare and contrast the cards. What do they have in common? What is different?
- Play “dominoes” with the cards. Student must justify what the cards have in common with any other cards they touch (see example on other page).
- Play “UNO” with the SET cards.

Color



red

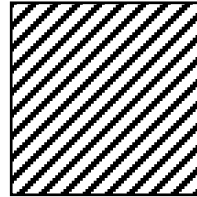


green



purple

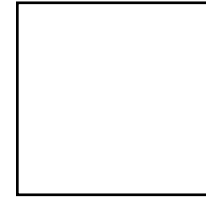
Shading



striped

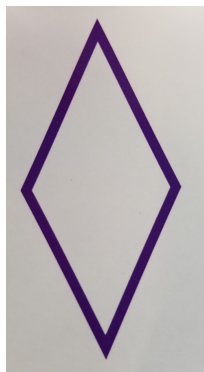


solid



empty

Shape



rhombus



oval



squiggle

Amount



1

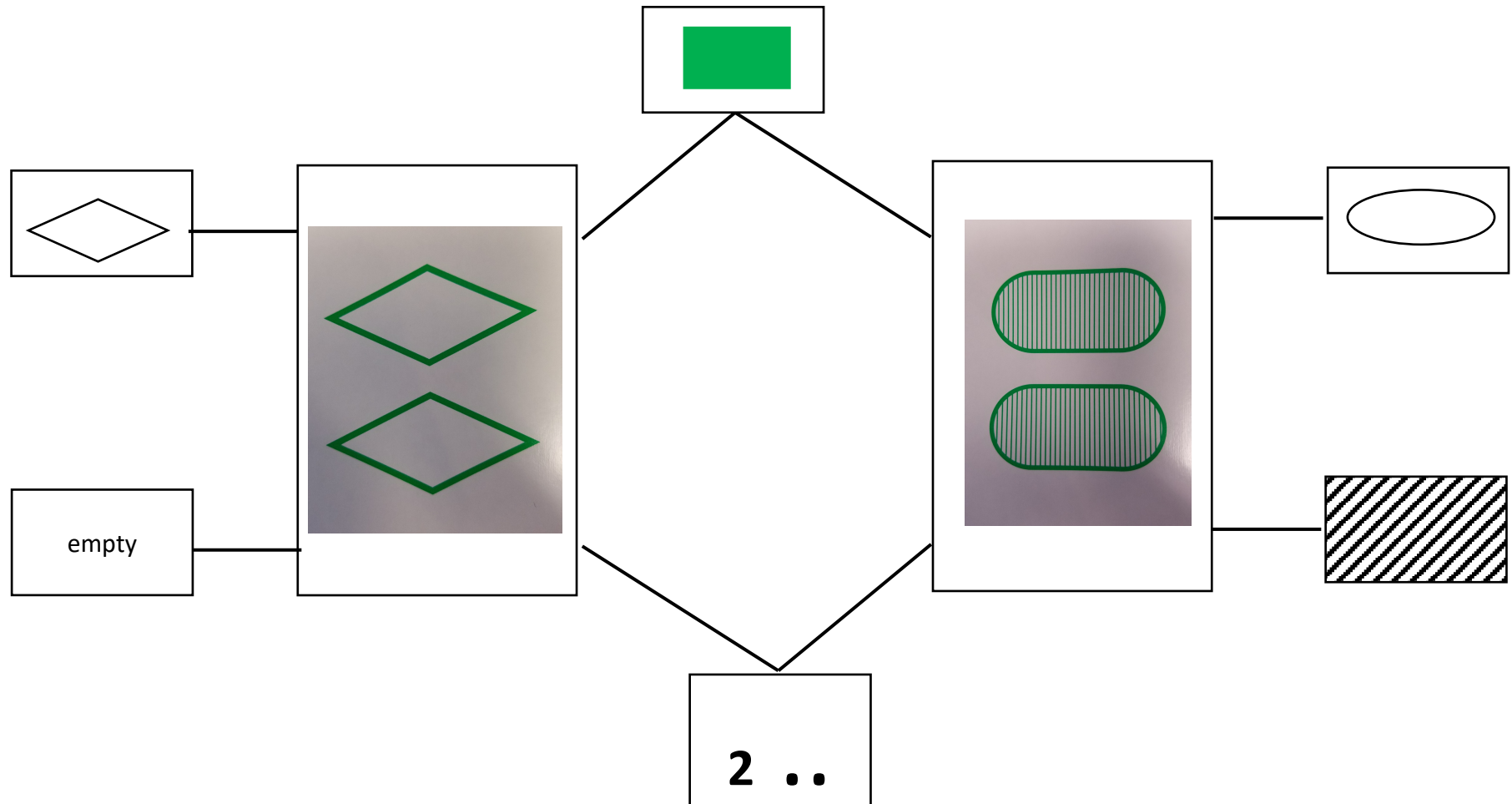


2



3

**\*\*Example**

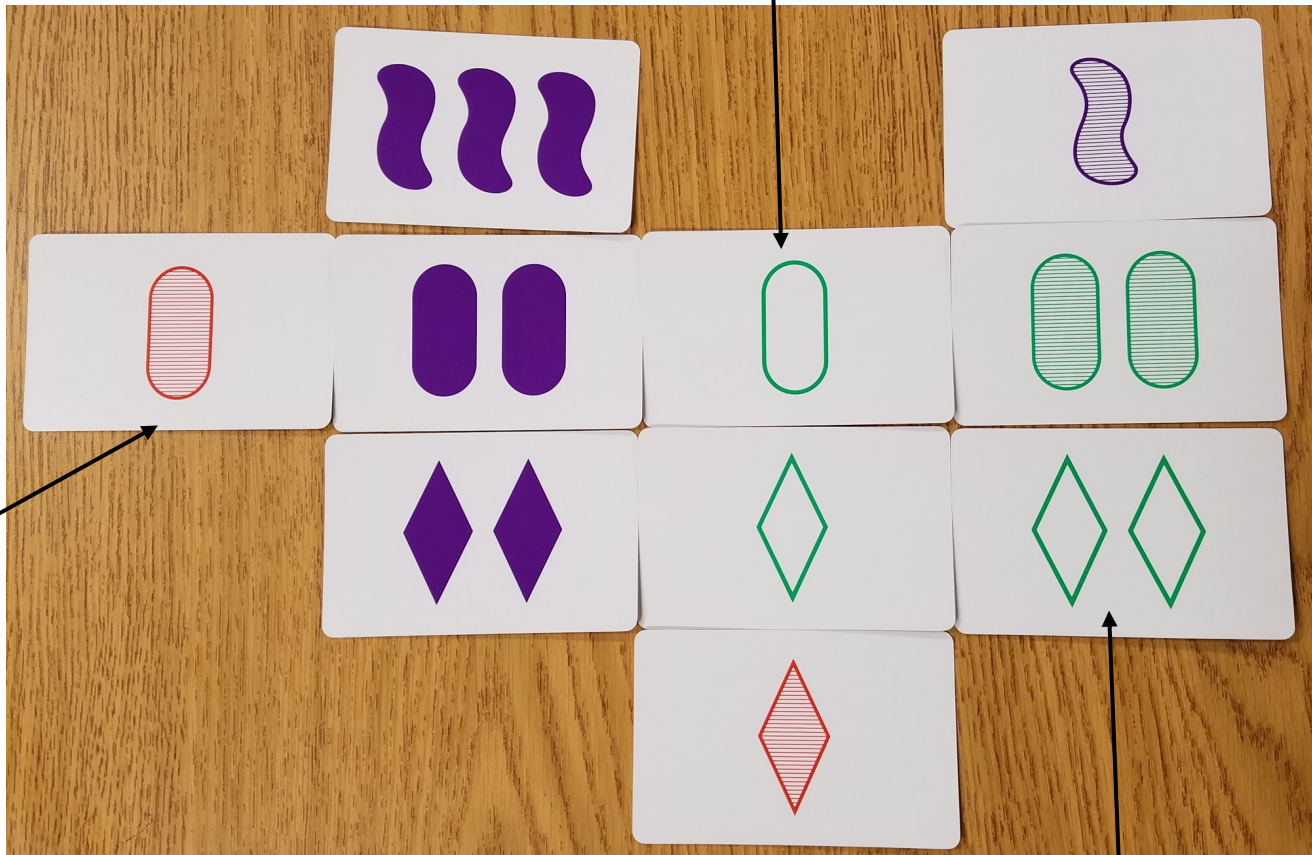






**\*\*Dominoes game using SET cards**

This card has an oval like the cards to its left and right. It has one empty, green shape like the card below it.



This is an oval, and the card it touches also has ovals.

This card has green, empty rhombuses like the card to its left. It also has two green shapes like the card above it.

## 5. Art/Puzzles

**Domain:** Geometry

**Focus Skill:** Students will use their understanding of how shapes fit together to create a larger shape.

**Materials:**

- Pattern blocks
- Pattern block puzzles with lines (lots available online to print)
- Pattern block puzzles with just an outline
- Computer paper and pencil/marker

**Directions:**

1. Students select a picture to build with pattern blocks.
2. Students may work with a partner as they experiment with how the shapes fit together.
3. Explore several pictures; if students are proficient with the puzzles that show individual blocks, try transitioning to puzzles with just an outline.
4. As students explore, try asking these questions:
  - Are there any shapes that are difficult to use? Why?
  - Which shape did you use the most of in that design?
  - How many of each shape did you use?
  - Do you have the same amount of any of the shapes?

**Extensions:**

- Have students create their own designs on white computer paper and trace around them. Students with fine motor struggles may need an adult to trace the design for them.
- Have students replicate the picture directly beside the puzzle instead of on top of the puzzle.
- Have students complete the same design again, this time with no <hexagons> (or other shape as chosen by the teacher).

**Note:** This activity works best if done in a teacher-lead small group first so students develop an understanding of the task. Later, students could do this independently during centers.

## 6. Science

**Domain:** Measurement and Number Sense

**Focus Skill:** Students will use their understanding of heavy/light and more/less to determine how many of a specific shape it will take to balance the scale.

**Materials:**

- Pattern blocks (all the same thickness)
- Pan balance with bucket/lid
- Number Path

**Directions:**

1. Have one child designated as the “hider” and the rest as “seekers.” The Hider should choose several of the same shape to hide on one side of the balance (for example, 4 trapezoids).
2. The seekers then take turns trying to balance the two sides by adding or removing the same shape (trapezoids) until both sides are even.
  - ☞ Students may need prior exposure to the fact that if the “Seekers’” side is too heavy (or too light), it means some need to be removed (or added).
3. Once the scale seems to be balanced, remove the contents from each side and check to make sure they have the same number of shapes.

**Extensions:**

- Have the Hider use larger shapes (hexagons or trapezoids) and see if the Seekers can find how many smaller shapes will balance. (For example, 1 trapezoid = 3 triangles.) If students have had exposure to pattern block puzzles, they will be more likely to make such observations.
- Have students use a number path to see if they can narrow down how many shapes may be hidden. If there are 5 trapezoids on the Seekers’ side, and it’s too heavy, then there are too many trapezoids. So, there must be fewer than 5 on the Hider’s side.

**Note:** This activity works best with 2-4 students independently, but could be done in a large group setting where the teacher is the “Hider.”

1	2	3	4	5
6	7	8	9	10

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## 7. Home Living/Dramatic Play

**Domain:** Counting & Cardinality, Sorting

**Focus Skill:** Students will sort animals and practice one-to-one correspondence.

**Materials:**

- Attribute cards (colors, number of legs, etc)
- Stuffed animals or baby dolls
- Dishes (paper plates, plastic cups, plastic utensils, napkins)

**Directions:**

1. Have children select an attribute cards and find all the animals/dolls that match that attribute. (For example, a red card may mean children find all the animals that have red on them.)
2. Once the animals are seated at the table, children must set the table to prepare for dinner.
3. Students should pair one plate, cup, and napkin with each animal.
4. After serving dinner, the animals may go home for the night, and the activity may be repeated with a different attribute card.

**Extensions:**

- Have children create their own attribute cards.

**Note:** If children have a difficult time cooperating, it may be important to assign jobs – one person sets the dishes, one for napkins, etc.

Red

Big

Little

Has Two Legs

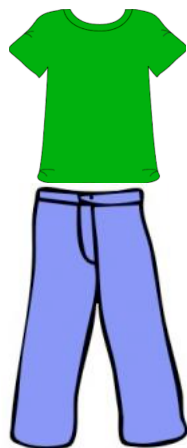


Lives in the Forest

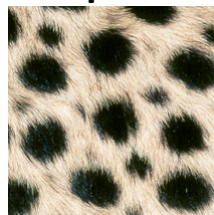


Create Your Own

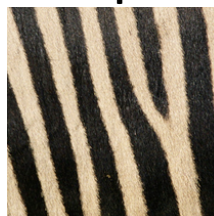
Wearing Clothes



Spots



Stripes



Has Whiskers



Lives in a House



## 8. Sensory Table (Sand & Water Table)

**Domain:** Measurement

**Focus Skill:** Students will explore standard and nonstandard tools of measurement; they will make observations about measurements and note comparisons.

**Materials:**

- Measuring cups & spoons
- Small containers
- Large container or sensory table
- Sensory material (water, sand, rice, beans, pompoms, etc)

**Directions:**

1. Fill sensory table or large container with a sensory material (sand, water, beans, corn kernels, rice, pompoms, etc).
2. Add a variety of measuring tools (small containers, measuring cups & spoons).
3. Allow children to scoop and pour from one container to another.
4. Ask questions such as “What do you think will happen if you pour this container into that container?” “Why do you think some fell out?” “What do *you* think those numbers/markings mean?”
  - ☞ Possible student observations: “This big scoop holds 4 of these little scoops.” “That container holds way more than the other containers.” “When I pour from this scoop to that scoop, some of it falls out.”

**Extensions:**

- Have students use drawings and annotations to make a recording of their findings on chart paper. (For example, the 1 cup scoop holds more rice than the 1 Tbsp spoon.)
- Adjust your sensory materials for a specific season (acorns in fall, snow in winter, etc).

**Note:** Leave the activity out for several days up to a couple weeks to allow for multiple explorations.



## 9. Art

**Domain:** Geometry & Operations and Algebraic Thinking

**Focus Skill:** Students will create and record patterns using shapes.

**Materials:**

- Pattern blocks (Large and/or magnetic pattern blocks add an element of fun)
- Other shape manipulatives (tangrams or attribute blocks)
- Art media (chalk, paint, markers, oil pastels, crayons, dot markers, etc)
- Construction paper (1/2 sheets)

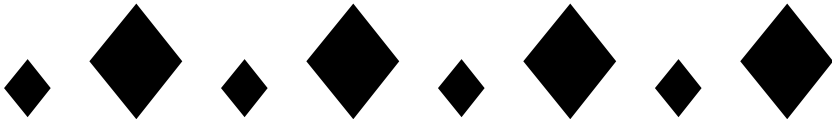




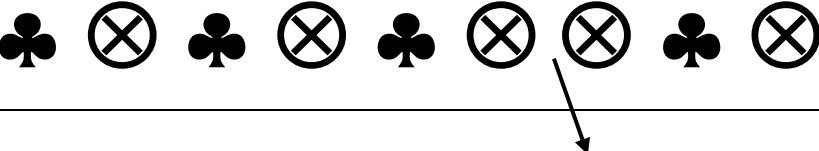

**Directions:**

1. Provide students with shape manipulatives or paper pattern blocks.
2. Encourage them to create a pattern with the manipulatives or paper pieces.
3. Have students record their pattern by drawing it (to the best of their ability) with one of the choices provided. Students may also choose to glue or trace the paper pattern blocks onto a sheet to preserve their pattern.

**Extensions:** (See examples on next page)

- Have a child create a more complex pattern such as A-B-C or A-B-B or A-A-B
- Ask a child to complete a pattern: What comes next? A-B-A-B-\_\_?\_\_
- Ask a child to fix a pattern: How can I fix this? A-B-A-B-A-A-B

**Note:** For it to be a pattern, the portion that is being repeated (the unit) must make at least one full repetition. For example, a B-G pattern would have to have at least B-G-B-G to be a pattern. B-G-B would not be a pattern because the unit (B-G) has not repeated fully.

Pattern Examples	
A-B (Size)	
A-B-C (Type)	
A-B-B (Color)	
A-A-B (Direction)	
Complete the pattern	
Broken pattern	
Repaired pattern	

## 10. Computer/Technology

### Materials:

- Computer, laptop, or iPad
- Internet access to the following websites:  
[www.mathlearningcenter.org/resources/apps](http://www.mathlearningcenter.org/resources/apps)  
<https://illuminations.nctm.org/mobile/>
- Projector (optional)

### Directions:

1. Math Learning Center: These activities offer an opportunity to expose students to models such as pattern blocks, geoboards, ten-frames, and number racks.
2. NCTM Illuminations: These activities offer some digital interactives as well as lesson plans. Using the search bar on the right, choose PreK-2, your domain preference, and any key words you wish to look for.

**Note:** The NCTM Illuminations link above takes you to their free activities. It is highly recommended that you explore the activities thoroughly before letting your students work independently on them.