Integrating Computing Across the Curriculum

Title:	Transformations
Grade(s):	Fifth
Subject(s):	Math
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Overview:	This lesson will help students to develop their spatial memory and spatial visualization skills, to recognize and apply transformations, and to become more precise in their use of vocabulary about space.
Content Standards:	Math (5) 8.4 Predicting the results of a flip (reflection), turn (rotation), or slide (translation). TEC (3-5) 2. Use various technology applications, including word processing and multimedia software. TEC (3-5) 12. Create a product using digital tools.
Local/National Standards:	
Primary Learning Objectives:	Students will: Recognize and apply slides, flips, and turns. Use spatial memory and spatial visualization skills.
Additional Learning Objectives:	Students will demonstrate a positive learning attitude toward mathematics.
Approximate Duration of Lesson:	2 days for 60 minutes daily; 1 day will be used for assessment
Materials and Equipment:	Crayons or colored pencils, pattern blocks
Technology Resources Needed:	Computers with Scratch and Internet connection; Scratch animation "Flips, Turns, Slides"
Background/ Preparation:	Students will need background knowledge of the following terms: **translation, reflection, rotation**

- Slide (translation): This is when an object moves upwards, downwards, or over. It "slides" across the page.
- Flip (reflection): This is when an object "flips over" to give us the mirror image.
- Turn (rotation): This is when an object is turned around a single point. Imagine pinning a card to the bulletin board, then *turning* the card around that point.

Procedures/Activities:

Step 1 Get students engaged by asking the following questions:

- How many have gone down a slide?
- How many have ever seen or can do a backflip?
- Who would like to show the class how to turn around?

Step 2

- Once students are engaged the teacher will explain that today's lesson will teach them how to slide, turn, and flip objects in geometry.

- The teacher will have students get down on the floor and will show them how a shape is flipped.
- The teacher will then have a volunteer show the class what a flip will look like, then each child will flip from their stomachs to their backs or vice versa.
- The next volunteer will show the class what a turn would look like (*students are still in their positions on the floor*).
- The last movement will be shown by another volunteer (*students should simply slide to the opposite side of where they begin to show this concept*).

Step 3 The teacher will show a Scratch animation ("Flip, Turn, Slide") to the class.

Step 4 The students will be placed in groups to create a Scratch activity based on their knowledge of transformations, including examples of flips, turns, and slides.

Attachments: Scratch Project "Flip, Turn, Slide"

Assessment Strategies: The student's Scratch project must appropriately demonstrate the correct use of transformations (flips, turns, and slides).

Extension: Have the students perform a translation, reflection, and rotation using geometric shapes (square, circle, and triangle) across the x and y coordinate plane.

Remediation: Students may watch this video about Slides, Flips, and Turns. After observing the video, the students may demonstrate the mathematical dance.
www.youtube.com/watch?v=nmCkZT_-9QY