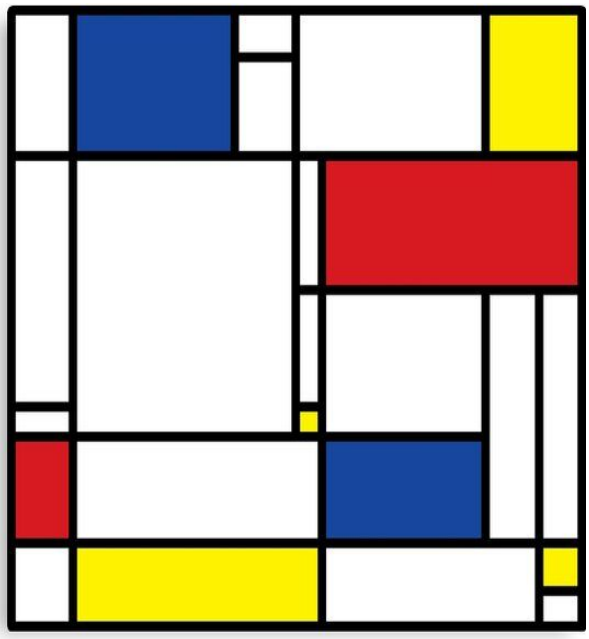
Brain-Targeted Teaching® Model
Arts Integrated Learning Unit

Unit TItle: Geometric Forms in Our World
Grade: Kindergarten
TIme Frame: 6 class periods at 25 min each



This unit is based on a unit designed by graduate students in JHU's Explorations in Mind, Brain and Teaching course, Fall 2020 in the International Teaching and Global Learning Program. The original authors are Lu Chen, Qiusu Wang, Xiaoli Sun, Liya Lin. It has been edited and formatted for this site. The accompanying pdf of slides, Called Geometric Forms, has not been edited.

Unit Goals:

Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres).

Students will be able to compose simple shapes to form larger shapes.

Learning Unit Overview:

This geometry unit is designed for K-level students. In this unit, students will spend 6 periods studying geometric shapes. Mathematical thinking begins when students recognize the similarities among objects or events. Later, they will learn to generalize and think abstractly. The learning goal for students is to identify, describe the traits of and compare common geometric shapes. Students will investigate art processes and materials including visual, creative movement, visual analysis and music to achieve unit goals. To evaluate students' learning, students will complete a personal journal with their parents to reflect their understanding and engagement in the activities.

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BT1: Setting the Emotional Climate for Learning

Emotional Connection:
Setting the emotional climate for learning may be the most important task a teacher embarks on each day (Hardiman, 2012). A positive spirit promotes learning, however, when students suffer from hunger, lack of sleep, etc., they will be in no mood to study. Therefore, it is important for teachers to set the emotional climate in the classroom.

- **Students Check-Ins.** Each class will begin with student check-ins. One of the best ways to build relationships between teachers and students is through frequent one-to-one Check-ins.
- **Classroom Rituals.** Rituals help motivate and engage students and build a sense of group identity (Hardiman, 2012). The ritual of check-in drives both self and collective awareness.
- **Classroom Celebrations.** Dr. Hardiman confirms that celebrating academic success often helps to strengthen a child's sense of belonging and build team cohesion (Hardiman, 2012).

BT2: Creating the Physical Environment for Learning

Hardiman (2012) indicates that "Learning is optimized when children are in environments that are free from clutter and are aesthetically pleasing" (p. 69).

- The background of our classroom is green, as this color can protect students' eyes. Windows allow light to penetrate into the classroom creating a more comfortable learning environment and improving students' academic achievement. Students who studied in classrooms with the most daylight demonstrated better scores on math assessments (Hardiman, 2012).
- Nature-scented aromatherapy was used, as well as comfortable lighting

and air conditioning, Scents can affect mood and performance to enhance students' concentration and memory (Hardiman, 2012).

- Seating is varied and uses geometric shapes (lesson goals) to organize classroom management.
- Students' desks and classroom furniture are designed with content related images and object, including a bookshelf with books on geometry,
- Students could choose fitness balls or ordinary chairs as their seats for class. Our colorful carpet is made up of graphics, which helps students find shapes and prepares them to study better.
- Our indoor learning environment featured content-related images and real-world examples. Student work hung at eye level for the students to access.
- Display of class norms, that are organized by students.

BT3: Designing the Learning Experience

Common Core State Standards require that students be able to identify and describe shapes, as well as analyze, compare, create, and compose shapes.

MATH

K.G.A.1: Describe objects in the environment using names of shapes and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.

K.G.A.2: Correctly name shapes regardless of their orientations or overall size.

K.G.B.4: Analyze and compare two-dimensional shapes with different sizes and directions to describe their similarities and differences.

K.G.B.5: Model shapes in the world by building shapes from components and drawing shapes.

K.G.B.6: Compose simple shapes to form larger shapes.

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VISUAL ARTS

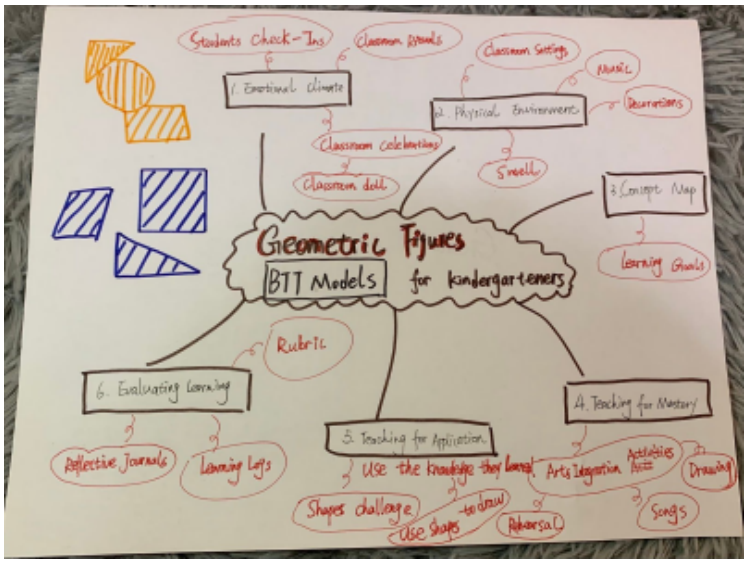
Anchor Standard 1: Generate and conceptualize artistic ideas and work.

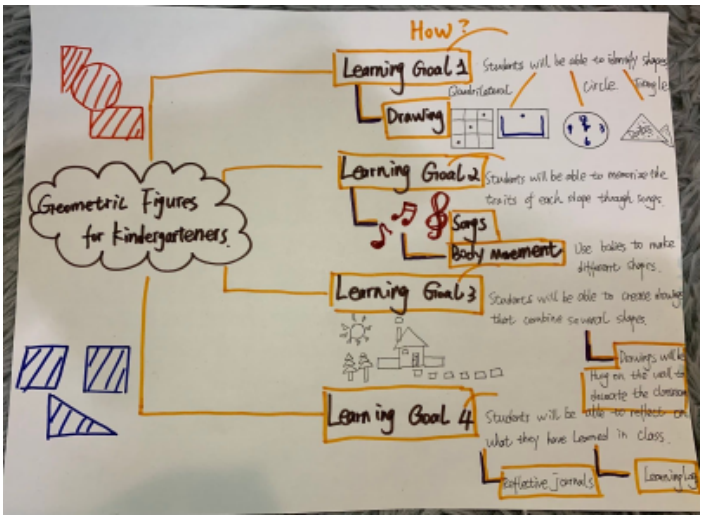
VA:Cr1.2.Ka: Engage collaboratively in creative art-making in response to an artistic problem.

VA:Cr2.3.Ka: Create art that represents natural and constructed environments.

VA:Re8.1.Ka: Interpret art by identifying subject matter and describing relevant details.

Unit Planning Maps





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BT4: Teaching for Mastery of Skills, Content, and Concepts

Learning Tasks:

- Students investigate and analyze master artwork that uses geometric shapes. (Matisse, Mondrian, Okun AKpan Abuje, Nigerian Funerary cloth, Gee's Bend quilts)
- Students memorize the traits of each figure through songs
- Students draw from imagination and as well as from observation of shapes in real world settings. They draw to understand structure and form.
- Students design games that use key shapes.
- Graphic displays, mapping and diagrams facilitate students understanding and engagement.
- Students reflect on what they have learned in class, through journaling and a guided parental conversation

BT5: Teaching for Extension and Application of Knowledge

- Students create collaborative drawings that combine several shapes.
- Students engage in creative movement games to analyze shape in everyday objects.
- Students write poetry that describes how they see shapes in nature.

BT6: Evaluation of and for Learning

These assessments were inspired by Dr. Hardiman, who wrote: "Teachers should consider the benefits of both learning logs and reflective journals for

their students and utilize whatever combination seems most appropriate for the particular population of students they serve" (p. 156). By meticulously evaluating the pros and cons of both tools with the developmental level and characteristic of Kindergartners, we believe such combination could facilitate K's learning most. Second, we believe Parents have a significant impact on students' academic performance and holistic development. Through such interactions not only could parents know the quality of their child's learning at the school but allows them to meaningfully participate in their child's development.

According to Dr. Hardiman's research, we identified 3 potential benefits of applying such an assessment model in our class.

- Reflective journal writing allows students to "contemplate what they have learned and explore it in a relatively freedom fashion", which "has been shown to encourage more metacognition and the use of more sophisticated cognitive strategies" (p. 155).
- Learning Logs could motivate students' candid description of actual attainment of knowledge.
- Rubrics serve as guidance to model the practice of critical reflection, thereby improving the quality of engagement and learning outcome of students.
- Students reflect on what they have learned in class, through journaling and guided parental conversation
- Learner Log rubric
- Gallery Walk **-** Presentation of drawings using appropriate vocabulary
- Creative movement dance rubric
- Drawings checklist
- Poetry rubric

References

Hardiman, M., & Denckla, M. B. (2012). *The brain-targeted teaching model for 21st-century schools*. Thousand Oaks, California: Corwin.

Hardiman, M., Rinne, L., & Yarmolinskaya, J. (2014). The Effects of Arts Integration on Long-Term Retention of Academic Content. *Mind, Brain & Education*, *8*(3), 144–148. https://doi-org.proxy1.library.jhu.edu/10.1111/mbe.12053

Rinne, L., Gregory, E., Yarmolinskaya, J., & Hardiman, M. (2011). Why Arts Integration Improves Long-Term Retention of Content. *Mind, Brain, and Education, 5*(2), 89-96. doi:10.1111/j.1751-228x.2011.01114.