**M201 / E343: Mathematics in the Elementary School**

**Lesson Plan Template**

**Lesson Topic:** Copying Cubes and Matching Faces **Grade level**: Kindergarten **Length of lesson:** 40 min

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| **Desired Results** | |
| **State Content Standard(s):**   * K.G.2 Compare two- and three-dimensional shapes in different sizes and orientations, using informal language to describe their similarities, differences, parts (e.g., number of sides and vertices/"corners") and other attributes (e.g., having sides of equal length). * K.G.3 Model shapes in the world by composing shapes from objects (e.g., sticks and clay balls) and drawing shapes. | |
| **Central Focus (learning goals):**  Students will understand:   * How to compare and match three-dimensional shapes by describing their similarities, differences, and attributes * How to model a real world 3D shape using the same pattern and number of cubes | **Essential Question(s):**   * How can you build a 3D shape? * How can you copy the attriubtes of a 3D shape? * How can you identify the features of 3D shapes? * Where do 3D shapes exisit in the world around us? * What similarities can you find between two different 3D shapes? |
| **Student objectives (outcomes / performance goals):**  Students will be able to:   * Create a 3D shape that has the same attributes as the model 3D shape * Describe the similarities between two solid 3D shapes | |
| **Learning Plan** | |
| **Learning Activities:**  **LAUNCH (5-10 minutes)**  \*Class is sitting on their spots in the front of the classroom for whole-class instruction\*  “Today we are going to be adding two new stations! Our first new one is called Copying Cubes. So, I have this shape here (hold up airplane made of cubes). Can anyone tell me what it’s called?”  \*Call on a student to answer\*  “So, your job is to try to build an EXACT copy of my airplane, or whatever figure I might show you. So, if I ask you to build an EXACT copy, what do you think I mean by that?”  \*have students answer and guide them toward pointing out size and shape\*  “(repeat back to students what they said) Yes, in order to be exact it should have all of the same features of my shape, like size and number of cubes. So, make sure you remember that when you’re working at that station.”  “Now, we have one more new station! This is called Matching faces. Can anyone tell me what a face on a shape is?”  \*call on student to answer\*  “(repeat the students answer)”  “Can you come up and show me what the face of this shape is?”  \*have student come to the front of the class and point to the face on the geoblock\*  “(confirm or correct what the student says to the class). So, when you get to this station and Mr. Moon holds up a shape, you’ll have to find a shape that has a matching face. So let’s just practice real quick. If I hold up this shape (hold up square), can someone show me which of these (sit out other geo blocks) has a shape that matches?”  \*call on students to answer, have one student come up and show which shape has a matching face\*  “(confirm or correct what the student says) Great job! You guys totally got this. Oh, and of course we have one more station. But you’ve already done this. Does anyone remember what you did last week during the shape hunt?”  \*call on a few different students to answer and guide them to explaining the activity\*  “(repeat the students answer and confirm activity) You guys seem like you’re ready to get started! Mrs. Daunhauer is going to put you in three groups and you’re each going to get a chance to try all the stations!”  \*send each group to their first station\*  **Station 1- Shape Hunt (5-10 minutes) (led by Cate)**  **INVESTIGATE**  **SUMMARIZE**  **Station 2- Copying Cubes (5-10 minutes) (led by Emma)**  **INVESTIGATE (5-7 minutes)**  1. Each student will have a pile of cubes in front of them (each students set of cubes should be the same color)  2. Teacher will have three different figures created, sitting on the table.  2. Each student will work on building figures that match.  3. After a student builds a matching figure, they will show the teacher to confirm it’s correct. If they get it right, they can take it apart and build one of the other figures in the middle of the table.  4. If the teacher notices that a student is struggling with recreating a figure, they can give them a smaller model with less cubes to try to recreate  5. If the teacher notices that a student finishes all 3 figures very quickly, give them the challenge of creating their own figure and building a copy of it.  (This activity will give students practice with constructing 3D shapes)  (The teacher should be noticing how students approached the task, should be checking students for accuracy after building each shape, and should be asking frequent assessing questions about how they know their figure is identical)  **SUMMARIZE (1-3 minutes)**  1. The teacher should let the students finish the last figure theyre working on and then collect materials  2. Guide a discussion to check for understanding:  “How did you know that the copy you built was identical to the original? Turn and talk to your neighbor”  \*Give students time to talk with a partner\*  “Can someone tell me what they talked about with their partner”  “(after student answers) Did anyone have a different way of knowing?”  (Students should explain that they counted, held it up to the original, compared the size and shape)  “(conclude discussion based off student answers)You guys did a great job with this activity and building your own 3D shapes!”  **Station 3- Matching Faces (5-10 minutes) (led by Jarrod)**  **INVESTIGATE (5-7 minutes)**  1. Each student will have a complete set of geo blocks in front of them.  2. The teacher will also have a complete set of geo blocks in front of them.  3. The teacher will hold up one shape and instruct each student to find that shape in their own pile  4. The teacher will then have the students find a shape that has a matching face  (ex. “Okay, I have a cube. Can everyone find their cube? \*wait for everyone to hold cube\* Can everyone find a shape that has the same face as a cube does? Hold it! Hold it!” \*encourage students to find it and hide it and then on 3, everyone reveal their matching shape\*)  5. When every student has a matching shape, reveal them to the group.  **SUMMARIZE**  6. “How did you know this one had a matching face?” The teacher will then call on a student to explain why they chose that shape.  7. Call on another student and ask if they agree or disagree with the other students reasoning. Let this lead to a discussion  8. Repeat steps 3-7 for as long as time allows  (The teacher should notice if students look at all sides of a shape to determine if it has a matching face, if they consider all attributes of shapes, and the vocabulary they use to describe these shapes)  (When students are explaining how they knew it had a matching face, they should be describing attributes or 2D shape names)  **INVESTIGATE**  9. If the teacher notices a student is struggling, give them a set of only 2-3 shapes to choose a matching face from  10. If the teacher notices that the group is getting these quickly and are becoming bored, split them into partners and have them test each other. (ex. Student A will hold up a shape for student B to find a matching face for) | |
| **Assessment Evidence** | |
| **Performance Task(s):**   * **Goal of Station 1:** * **Goal of Station 2:** Students will build at least one exact replica of the original figure and students will be able to describe how they knew it was identical. * **Goal of Station 3:** Students will identify matching faces of 3D shapes and describe the attributes that make them match. | **Other Evidence:**  *N/A- all evidence in performance task* |
| **Resources and Materials:**   * Cubes * 2-3 bags of geo blocks * Clipboards * Shape hunt worksheet | |
| **Additional Modifications for Individual Students:**   * **Station 1:** * **Scale up:** * **Scale down:** * **Station 2:** * **Scale up:** If the teacher notices that a student finishes all 3 figures very quickly, give them the challenge of creating their own figure and building a copy of it. * **Scale down:** If the teacher notices that a student is struggling with recreating a figure, they can give them a smaller model with less cubes to try to recreate * **Station 3:** * **Scale up:** If the teacher notices that the group is getting these quickly and are becoming bored, split them into partners and have them test each other. (ex. Student A will hold up a shape for student B to find a matching face for) * **Scale down:** If the teacher notices a student is struggling, give them a set of only 2-3 shapes to choose a matching face from | |
| **Extending the Lesson**   * In the next lesson Jarrod will be going more in depth on sorting, classifying, and identifying characteristics of 3D shapes. I think that will be beneficial to do after this lesson because they will be able to build off of their knowledge from the matching faces activity. I think that the matching faces activity was a very concrete and simple way to introduce specific features on 3D shapes. I think that Jarrod’s activity will provide some more abstract ways of looking at 3D shapes and provide more mathematical vocab for how to accurately label the features found during my lesson. | |