**Exploring Diagonals and Triangles in a Rectangular Prism**

**Subject**: Mathematics/Geometry

**Grade Level**: 7-9

**Duration**: 1 Hour

**Objective**:

* Students will use a 3D geometry simulator to construct a labeled rectangular prism.
* Students will draw and identify all the diagonals within the rectangular prism.
* Students will identify and name the triangles formed by these diagonals.

**Materials**:

* Computers with 3D geometry simulator software (https://play.creaticode.com/projects/a744f73930ab290afd013931/)
* Projector or interactive whiteboard for demonstration
* Worksheets for noting down observations and sketches
* Pencils and erasers

**Introduction (10 minutes)**:

1. **Overview**: Introduce the concept of a rectangular prism and its properties.
2. **Diagonal Exploration**: Briefly explain what diagonals are in the context of 3D shapes, emphasizing their role in forming triangles within the shape.
3. **Software Demonstration**: Demonstrate how to use the 3D geometry simulator to create a rectangular prism and label its vertices as ABCDEFGH.



**Activity Part 1 - Constructing the Prism (15 minutes)**:

1. **Student Exploration**: Students will use the 3D geometry simulator to construct their own rectangular prism and label its vertices correctly.
2. **Guidance**: Circulate to assist with any technical issues and to ensure correct labeling of vertices.

**Activity Part 2 - Drawing Diagonals (15 minutes)**:

1. **Diagonal Instruction**: Explain how to identify and draw diagonals in the rectangular prism. Ensure students understand to look for diagonals on faces as well as through the volume of the prism.



1. **Drawing Diagonals**: Students will draw in all the possible diagonals they can find within their rectangular prism model.
2. **Make points**: add points on the picture to mark intersections of diagonals.



**Activity Part 3 - Identifying Triangles (15 minutes)**:

1. **Triangle Identification**: Instruct students to identify and name all the triangles formed by the diagonals in the prism. Draw them in the picture using a different color for each.



Sample started project:





1. **Recording Findings**: Students should record the names of these triangles and sketch them on their worksheets.

**Conclusion (5 minutes)**:

* **Review and Discuss**: Bring the class together to discuss their findings. Highlight the different types of triangles that can be formed in a rectangular prism.
* **Real-World Connection**: Briefly discuss the importance of understanding geometric shapes and their properties in fields like architecture, engineering, and design.

**Assessment**:

* Evaluate students based on their participation and the accuracy of their rectangular prism models.
* Review their worksheets for correct identification and naming of triangles.

**Extensions**:

* Challenge students to calculate the angles of the triangles they have identified.
* Introduce other 3D shapes and ask students to explore diagonals and triangles in these new shapes.

**Note**: Ensure that all students are comfortable using the 3D geometry simulator software. It might be helpful to have a tutorial session or guide available for students who are less familiar with such software.