Discovering STEM Program

Building Buildings - Grades 6 through 8 - Geometry

Use 2D blueprints to construct a 3D figure. Can you build it with fewer blocks? More blocks?

Materials needed:

- 5 sets of mini blocks
- 32 sets of blueprints cards (4 each)
- 32 sets of Isometric drawing cards (4 corners, 4 each)
- 5 sheets surface landscape

Pre-game Activity: Ask students to make a figure out of the blocks and allow them to see all the different perspectives of the figure (take a picture at table level or from directly above to help students see the object better).

Ask students what they see when they look from directly above or from a side. Have them draw what they see. Ask what other buildings can be made from one projection. Have students create several structures that all match one projection.

Set-Up:

- Write the word "front" on one edge of a sheet of paper.
- Build a 3 X 3 X 3 cube. Place it on the paper in the center of the table.
- Choose one set of blueprint cards or one set of isometric drawing cards.
- In teams of 3 to 4 give each student a card for a single figure.

Objective of the Activity: Construct a 3D figure from given 2D information.

Playing the Game:

1. On your turn, either remove a block, or replace a previously removed block, on the 3 X 3 X 3 cube so that the object matches the figure on your card.
2. Continue until all players are satisfied with the building.
3. You cannot show others their blueprint but can talk with each other as much as needed.
4. Once building is done, discuss whether the shape is unique or if a block can be added or removed but still agree with all the blueprint cards.
5. Repeat with another figure.

Think about it:

1. Ask these questions to the students:
    a. What worked well when talking with your teammates: What didn't work well? Why?
    b. What is the smallest number of blocks that can be used to make your building?
    c. What is the largest number of blocks that can be used to make your building?
    d. Were certain projections harder to work with than others? Why?

Variations:

Another view: Use side and top arrangements for blueprints rather than isometric projections**.**

Lone Builder: Use all cards in a set to build buildings by yourself.

Competing Buildings: Play against other teams to see who can build the building the fastest. Compare your final buildings to see if you agree that the building fits the set of cards each team is using.