Activity Plan Template

Title: Beyond the Set

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Topic: Set and its 4-dimensional coordinate equivalence

Connection to Core Curriculum: Modular Arithmetic

Overview: By the end of the activity students will be able to connect the game of SET to mathematical practices, such as mod n and coordinates.

Objectives: Students will relate using mod n to the game of SET and apply it by playing the game using the coordinates on the back of the cards.

Materials Needed: Youtube video instructions, Set random generator, and physical cards with the coordinates on the back.

Coordinates for online card generator:

Number: 1=0, 2=1, 3=2

Shape: diamond=0, squiggle=1, oval=2

Shading: solid=0, striped=1, open=2

Color: red=0, green=1, purple=2

Technology: A youtube video to explain how to play the game of Set (0:15-0:37). AI generated applet to randomly generate 3 cards from Set and it has the option to show the math behind the cards. AI also generated a document to print the set cards, but it was struggling with some formatting, so Marissa fixed the mistakes on Adobe Express.

Role of Technology: The video efficiently explains to everyone the basics of the game, saving time. The applet also saves time and provides equivalent coordinate points that we can show everyone to compare to the cards.

Activity Plan:

1. Teach how to play set by watching video 0:15-0:37 for the components on cards, and 0:45-1:12 for what a set consists of.

2. Introduce 4 dimensional coordinates for each card and remind them what modulo 3 is (0,1,2 are the only outputs possible).
3. Try 2 examples with a random generator as a whole class. Example: generate three cards and hide the coordinates. Ask questions like “is this a set from looking at the shapes/colors/shading/number” then convert them to coordinates and try solving it that way. You can show the generated math at the end to double check the work. Pass out 15 cards to each table while showing these examples.
4. Let them find a set using the pictures.
5. Tell them to flip over cards and find a set with coordinates
6. Check that adding all 3 card coordinates result in (0,0,0,0) mod 3, either in groups or together on the whiteboard.
7. Play more rounds if time allows

Background:

This activity is based on Marissa’s topic about the math behind SET and we’re excited to give the class a glimpse into how it works and how it’s applied.

Included documents:

printable PDF for set cards (ChatGPT helped a little bit, but Marissa made the pages with the ovals)

References:

SET card generator created by ChatGPT, that randomly selects three cards from the game of SET. Click the link that says “download the interactive SET applet” and it’ll open up the applet. SET Generator

Video 0:15-0:37 (components on cards), 0:45-1:12(what a set consists of): https://mathcircles.org/activity/set/