

See: www.setgame.com

A nonconsecutive Set of lessons

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Math, grade 6

Topics: counting, graph theory, Venn diagrams with the game Set

Prerequisites: Venn diagrams, some graph theory, some counting/probability background. It is helpful to have some students familiar with Set.

Materials: several decks of set; copies of example sets; board or chart paper for recording results.

Time required: each lesson needs 60-90 minutes.

Day One: Introduce the game deck. Give each group a card. There are four parameters per card; students must name them (number, color, texture, shape). Now hand out example sheet.

Brainstorm for what makes a set (all parameters different or the same). Break into small groups to play a brief informal game (10 minutes).

Try to do a Venn diagram on the board; why does this break down? Hint: how many cards in each category?

Since there are no repeats and no missing combinations, how many cards are there? Do a tree graph. I start; students complete (guided).

Day two: Start with the question; For any two cards, there could be how many matches? Do examples. Now barring color and texture, make a graph with vertices representing sets and edges connecting sets with at least one common card (5-10 minutes). Discuss. What do you predict will happen when we add texture?

With your group, try to find a way to figure out how many cards we could have down and not have a set. Compare techniques.

How many cards do we fear if 1 card is down? What about two? Chart number of cards down, number of cards feared, and total. When total is more than 81, we must have a match down.

Explorations and extensions: Continue match graph; try student algorithms; how many possible matches are there in the deck?

Evaluation opportunities: groups turn in graphs; brief constructed response on whether V diagram or tree graph is more applicable for representing this data and why; find a card that would make a set given two randomly drawn, with explanation.

Appropriate content standards connections:

Outcome 3.2; Organize and display data.

Outcome 3.6; Determine the outcomes of activities using counting techniques.

Outcome 5.1; Use information to define the questions within a problem.

Outcome 5.9; Apply what was learned to a new problem.

Outcome 5.15; Justify why an answer or approach is reasonable.

12Apr 2003