Math Magic

-9 Cards-

Educational Goals

- Improve logical thinking
- Learn a magic trick
- Understand how to use different manipulations to place a card at a specified location in a deck

Key Features of the Targeted Competencies

- Break down the elements of a situation/problem (C1)
- Model the problem (C1)
- Apply different strategies to create a solution (C1)
- Validate the solution (C1)
- Pinpoint the important elements of a mathematical situation (C2)
- Apply the appropriate processes and concepts for the situation (C2)

Concepts Used

- Positions
- Change of base (base 3)

Materials

- Video of the trick
- Decks of cards
- Paper clips
- Paper and pencils

Recommended grade

Elem Cycle Three

Skills developed

C1 C2

Field of Math

Suggested Teaching Method

Time Required
About 30 minutes

Suggested Process

Step 1: Introduction (5 minutes)

If you are comfortable performing the trick yourself, begin with Step 2.
Play the video of the magic trick (www.amazingmaths.ulaval.ca).

Step 2: Find solutions (15 minutes)

Perform the trick slowly in front of the class so the students can observe the movements closely. It is recommended to perform the trick multiple times, so the students can see which movements stay the same and which change.

Once the students have observed the trick several times, place them in pairs and allow them time to try recreating the trick on their own. Offer each group a deck of cards and paper clips. Do not initially tell them what to do with the paper clips. Ask the students to recreate the trick and understand how it works.

You can guide your students with the following questions:

- Are the magician's movements always the same?
- How does the magician deal out the cards?
- Why does the spectator have to indicate which column contains their card?
- How does the magician find the spectator's card?
- Does the trick work for all numbers (1 to 9)?
- How does the magician pick up the cards?

Finally, propose to the students to use the paper clips to follow the movements of the cards. Tell them that the magician's movements allow the magician to position the spectator's card.

Step 3: Share solutions (5 minutes)

See the explanatory document for the trick "9 cards."

In front of the class, perform the trick (*preferably, this would be done by a pair of students who were successful in solving the trick).* Place paper clips on the cards in the column that the spectator points at after the first deal. Remove the paper clips from the cards that aren't in the column that is pointed at after the second deal. This will help the students follow the selected card, and show them how the magician can find the spectator's card

During each step, explain what the magician does and why it is important. Explain how the magician controls the position of the selected card. Make sure the students understand that the magician does not need to know the card to place it at the right position.

Step 4: Recreate the Magic Trick (5 minutes)

If the students were initially unsuccessful in solving the trick, they may want time to recreate it now that they have seen the solution.