

Dialogs

Thursday, September 1, 2016 9:07 AM

Introduction

You are actors creating a situation. Each Dialog involves a mathematical discussion... or argument... or problem. Follow the cues and remember that interpretation and creativity are up to you. Bring enthusiasm to your role! In some cases you may wish to consult with another person before you start. This can be another *student* or you can consult with the Producer or a teacher or other adult. Library research is also encouraged!

Game Show

Card 1

You are Monty Hall, the host of a famous game show. You like to play a particular game where you have a Good Prize to give away and two Crummy Prizes. These will be provided for you by the show's Producer whose name is Mr. Kilroy. You will also be given three cans and a screen. Here is your procedure for playing the game; which we will play several times.

The Contestant is across from you. You place the screen in front of the cans. The contestant must not see how you distribute the prizes. You put one prize in each can and you must remember to yourself which can has the Good Prize. If you like you can use a die to choose where the Good Prize goes. Let's say you put it in Can 1.

Now you lift the screen and separate the cans. You say something like this:

"In these three cans are two Crummy Prizes and a Good Prize. Your job is to pick a can. That's it. You win the prize in that can. Easy!"

The contestant will choose a can. However rather than simply lift the can to reveal the prize they have chosen you have a different task. Let's suppose they choose Can 2. First you say "Ah, I see you have chosen Can 2! What a great choice. However... I would like to show you something."

Now you lift up Can 3 (not Can 1!) to reveal that it contains a Crummy Prize. You say:

"Notice that you didn't choose Can 3, which is this Crummy Prize. But I'm going to give you a choice: Do you want to stay with Can 2? Or would you like to switch to Can 1?"

Allow the Contestant to stay or switch, and then reveal their choice. The important thing to remember is which Can has the Good Prize. Regardless of which can the Contestant chooses you must **always** reveal one of the two Crummy Prizes. You must never reveal the Good Prize.

Card 2

You are a contestant on a game show. You will play a game with the Host and you simply follow their instructions. Good luck!

Parole

Card 1

Explain to everyone:

You are the Warden in a prison. Four Prisoners have been chosen to be set free... if they can solve a puzzle. Let us call them Asa, Betty, Carol and Diane. They are sentenced to 40 years for chewing gum in

class.

Throughout the following they may not speak except to say one word. If they break this rule they go back to prison.

(You may ask them a question like 'what is your name?' to see if you can trick them into saying something; then send them back to their seats and get 4 new prisoners and start over.)

The Producer sets out three chairs. Place prisoners Asa Betty and Carol in these three chairs. Instruct the prisoners that they must look forwards at all times. From a deck of cards you select any two red cards and any two black cards. The Prisoners are shown the cards up front.

Choose a card so that Asa does not see it and place it facing backwards in Asa's headband. She cannot see it.

Do the same for Betty and Carol. For Diane place the last card face down. Notice that Carol can see Betty's card and Asa's card. Betty can see only Asa's card. Nobody can see their own card. Diane is in another room and may not look at her card, nor may she speak. She is more symbolic: She gives us a place to put the fourth card.

Notice these cards represent colored hats; they are just easier to use.

Say to the prisoners: When I say 'Go' you have one minute. In that time any of you except Diane may say one word. As soon as you say one word the game is over. If the one word matches the color of your own hat: You all go free (and you win a prize). Otherwise... well...

After the game is over we will discuss and just maybe we'll do this again.

The Argument Clinic

Card 1

You must argue *against* your colleague's point of view; but only using these two sentences.

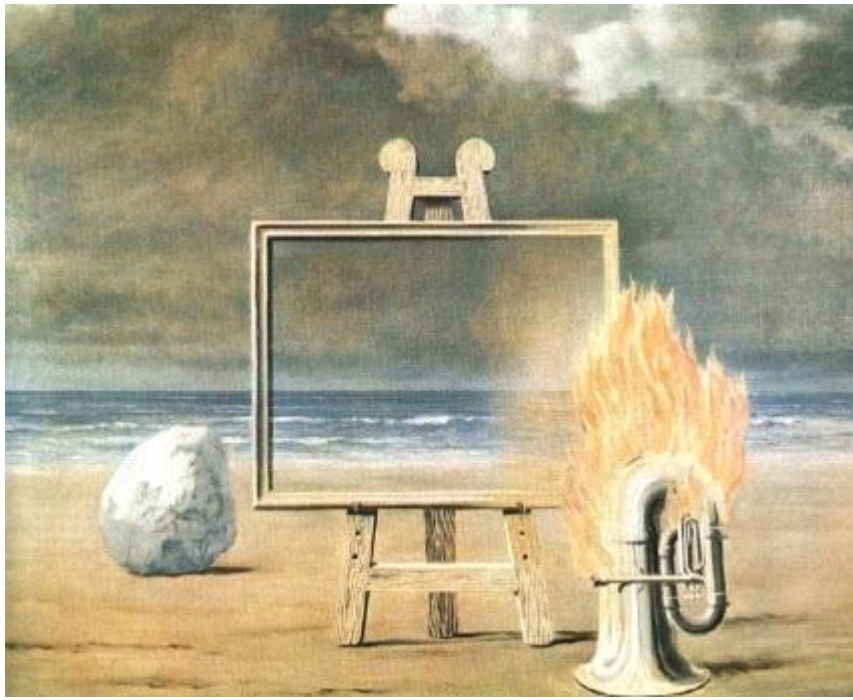
"I'm not sure about that."

"How do you know?"

Card 2

Your task is to prove that an even number times an odd number is even. You may wish to do a consult before starting. Begin with 'I have a new mathematical theorem: Even times odd is even.'

The Unfair Captive



Card 1

You will present a problem to your colleague. Here is how to present the problem; you may read it directly or you may memorize it. You may wish to consult with the Producer Mr. Kilroy so that you understand knights and knaves before you begin.

Your boat lands on the Island of Knights and Knaves. Knights always tell the truth and Knaves always lie. You approach the first person you see and say 'Hello. I am new here. Are you a Knight or a Knave?' They reply 'I am a Knave. May I give you a tour of the island?'

What do you do?

Card 2

Your colleague will present you with a situation and a question. Your task is to answer the question; but remember you are certainly encouraged to be creative.

Zeno Unstuck

Card 1

Your friend is worried. Find out why. Then reassure them that what they are worried about doesn't actually matter. Because why? Because they can never get to where they are going. Use the following argument:

- In order to get there they must first get half-way there.
- In order to get *there* they must first get one quarter of the way there.
- And one eighth, and one sixteenth, and so on.
- Therefore there are an infinite number of places to arrive before they get to where they want to go
- An infinite number of arrivals will take an infinite amount of time
- So you might as well sit down and relax and have another cookie

Card 2

You are late! Act stressed out. You're late! You're late! Say things like "I'm late! I'm late! Oh dear oh dear oh dear!" and "Oh my ears and whiskers! I shall be late late late late!!! I must hurry!" (Do not actually leave; that would be no fun. Instead let your friend find out why you are stressed out. Then let your

friend try and convince you to calm down. You choose how to react; but make sure to listen to their full argument.)

Powers and Roots

Card 1

Your task is to teach powers and roots. You begin by writing $2 \cdot 2 = 2^2 = 4$ and $2 \cdot 2 \cdot 2 = 2^3 = 8$. Then you write $3^2 = 9$ and you say 'And so on!'. Then say 'Now I will show you the backwards version of powers, which is roots.' You show that roots are just the reverse operation: $\sqrt[2]{4} = 2$ and $\sqrt[3]{8} = 2$ and $\sqrt[2]{9} = 3$ and so on. So everything works, forwards and backwards.

You conclude by saying this:

'Ahem. And so in conclusion the number 2 has exactly one square (4) and one cube (8) and so on; and the number 4 has exactly one square root (2) and the number 8 has exactly one cube root (2) and so on. Thank you.' After you are done your colleagues may have some questions for you.

Card 2

Your colleague is going to introduce you to powers and roots. She will use some examples. Then she will say 'Ahem' and make a concluding statement. Here are some questions you may wish to ask her after she finishes.

- What is -2 squared?
- What is the square root of 4?
- Can four have two square roots?
- What is the square root of -4? Is there one?
- What is the cube root of 8?
- Can eight have more than one cube root?

Ending and Beginning

At the end of each math club meeting we say, together: "Phi!"

At the beginning of each math club we have a leader read out and we repeat:

Please rise for the song of mathematics.

Repeat after me.

I.

State your name.

Solemnly swear I am up to no good.

I maintain.

That the number 8.

Has three cube roots.

I maintain.

That the square root of two.

Is irrational.

Tip of the hat to Tyee PTSA.

Tip of the hat to Bellevue Schools Foundation.

Until last week.

This is the other math club.

Starting.