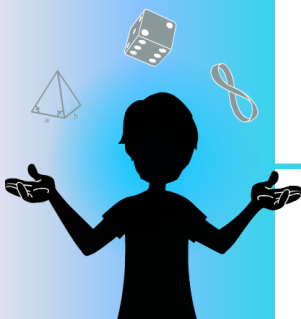




AMAZINGMATHS

Materials:

- Video of the puzzle
- Sheets of paper
- Pencils

PUZZLING CARTOON

- THE ROCK'N'ROLL BIRTHDAY -

The puzzle

Alice, Beatrice, Karine and Daphne are part of a rock band whose organization varies depending on the shows that they perform.

The only rule that never changes is, *if Alice is not playing the bass guitar, then Karine will not play the electric guitar.*

Today, for Michael's birthday:

- *Neither Daphne nor Alice is the lead singer*
- *Beatrice does not play the drum or the bass guitar*
- *Neither Daphne nor Alice plays an electric guitar*
- *Karine does not play the bass guitar and is not the lead singer*



For today's performance, which instrument did each member be playing?



PUZZLE SOLUTION



The answer:

Beatrice is the lead singer, Karine plays the electric guitar, Alice plays the bass guitar and Daphne plays the drum.

The solution:

First of all, there are 4 people: Alice, Beatrice, Karine and Daphne. Plus, there are 4 instruments: the voice, the bass guitar, the electric guitar and the drums.

To help us organize the pieces of information, it is helpful to create a table of possibilities. The black Xs represent the instruments the girls cannot play according to the puzzle's information.

	Alice	Beatrice	Karine	Daphne
Voice	X		X	X
Bass guitar		X	X	
Electric guitar	X			X
Drums		X		

For each additional piece of information, we simply add a **red X** when we eliminate a possibility and add a **blue circle** when we assign an instrument to one person.

With the following two pieces of information,

1. *Neither Daphne nor Alice is the lead singer*
2. *Karine does not play the bass guitar and is not the lead singer*

We can deduce that the lead singer is Beatrice, since Daphne, Alice and Karine cannot be. Also, we conclude that Beatrice cannot play the electric guitar, since she is already the singer.

There are then 3 people and 3 instruments left. (Alice, Karine and Daphne) (Drums, electric guitar and bass guitar)



PUZZLE SOLUTION



	Alice	Beatrice	Karine	Daphne
Voice	X	○	X	X
Bass guitar		X	X	
Electric guitar	X	X		X
Drums		X		

With the following piece of information,

1. *Neither Daphne nor Alice plays the electric guitar*

We can deduce that Karine plays the electric guitar, since the three other girls cannot play it. So, we conclude that Karine cannot play the drums since she plays the electric guitar.

There are then 2 people and 2 instruments left. (Alice and Daphne) (Drums and Bass guitar)

	Alice	Beatrice	Karine	Daphne
Voice	X	○	X	X
Bass guitar		X	X	
Electric guitar	X	X	○	X
Drums		X	X	

With the following piece of information,

1. *If Alice does not play the bass guitar, then Karine does not play the electric guitar*

We know that, since Karine plays the electric guitar, Alice plays the bass guitar.

Indeed, if Alice played the drums, Karine could not play the electric guitar, but with the previous pieces of information, we know that Karine really does play the electric guitar and then that Alice plays the bass guitar. So, we conclude that Alice does not play the drums, since she already plays the bass guitar.

	Alice	Beatrice	Karine	Daphne
Voice	X	○	X	X
Bass guitar	○	X	X	✗
Electric guitar	X	✗	○	X
Drums	✗	X	✗	

There is only one person and one instrument left. (Daphne) (Drums)

We conclude that Daphne plays the drums.

	Alice	Beatrice	Karine	Daphne
Voice	X	○	X	X
Bass guitar	○	X	X	✗
Electric guitar	X	✗	○	X
Drums	✗	X	X	○