Scripts for the films about the apps of the story *Mathina, the rosette game and the magic mazes* (7-10)

All the games begin and end in the same way:

Beginning

The initial image is projected during 5 seconds. The title includes: the name of the app (for instance "Mirror Maze"), the mathematical subject -- "Symmetry", the corresponding age-group -- "7-10", and a link to the app in the repository -- "https://...".

Ending

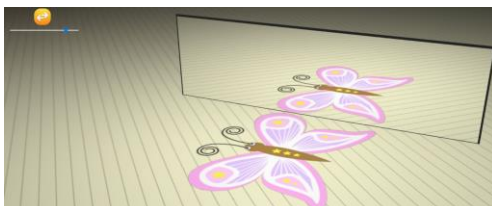**Background:** black screen. **White text displayed**:

- Mathina Project with the UE logo;
- List of partners with the corresponding logos;
- The educator's repository address.

Scripts for the films about the apps:[1]

Game 1, Using mirrors...

1. **Background**: a static image of the app.

- Simultaneously, the following **voice-over** is heard:

   "*This is the app "Using mirrors.." from the story "Mathina, the rosette game and the magic mazes"".*

- Then, the following **voice-over** is heard:

   "*Before playing the Rosette Game, and as Mathina has doubts about symmetry axes, the wizard uses a mirror to explain her that concept.*

   In this app, you can test if a given image has a symmetry axis."

2. A **screen recording** is projected showing someone solving the app. **Voice-over**:

   "*Two objects are presented in the app: a butterfly image and a mirror.*

   You can drag the mirror back and forth and see if, at some point, you can put the mirror in a position that allows you to reconstruct the original image of the butterfly just from half of it.

   And this happens when you put the mirror, here, in the middle: note that this half image, here, on the left, together with the half image which is appearing in the mirror (its reflection) form an image that seems equal to the original image.

   So you can conclude that this butterfly has a symmetry axis."

3. **Screen recording**. **Voice-over**:

   "*Note that, to move the mirror, you just need to drag the slider under this orange icon* 🔄"

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[1] The text in italic represents the content of the voice-over.

4. **Screen recording**. **Voice-over**:

"*With this app, in a playful and interactive way, it is possible to check if an image has a symmetry axis in a given direction.*"

Game 2, Rosette Game

1. **Background**: a static image of the app.

- Simultaneously, the following **voice-over** is heard:

"*This is the app "Rosette Game" from the story "Mathina, the rosette game and the magic mazes"".*

- Then, the following **voice-over** is heard:

"*While exploring Symmetry Fair amusements, Mathina tries to solve the Rosette Game.*

The Rosette Game is a challenge in which you should choose all the rosettes with symmetry axes."

2. A **screen recording** is projected showing someone solving the app. **Voice-over**:

"*You can choose a rosette by clicking on it. After choosing 4 rosettes, you should press this button* .

There are 3 rounds: in all of them, you must choose all the rosettes with symmetry axes.

If, at one point, you make a mistake and select wrong rosettes, you can go back by clicking . *And then you can correct your answer.*"

3. **Background**: the medals awarded at the end of the game. **Voice-over**:

"*In this game, I've received 2 gold medals and one silver medal.*"

4. **Screen recording**. **Voice-over**:

"*With this app, in a playful and interactive way, it is possible to identify the dihedral rosettes, those that have at least one symmetry axis.*"

Game 3, Bag Game (I)

1. **Background**: a static image of the app.

- Simultaneously, the following **voice-over** is heard:

"*This is the app "Bag Game (I)" from the story "Mathina, the rosette game and the magic mazes"".*"

- Then, the following **voice-over** is heard:

"*Mathina would like to keep the rosettes she won in the Rosette Game. However, to get them, she still needs to solve another challenge: the Bag Game I.*

*The aim of this game is to separate the rosettes according to their number of symmetry axes.*"

2. A **screen recording** is projected showing someone solving the app. **Voice-over**:

"*For that, you should drag each rosette to the corresponding bag: if the rosette has a symmetry axis, it should go to bag 1, if it has 2 symmetry axes, it should go to bag 2, and so on...*

3. **Screen recording**. **Voice-over**:

"*Now, we will see some tools available in the program.*

If in doubt about the symmetry axes, you can click *.*
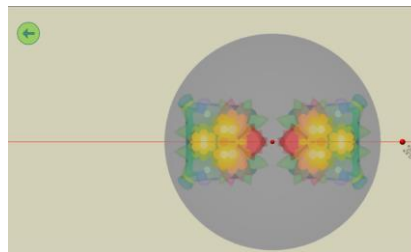
In this menu, you can rotate the red line by dragging this red dot ⬤ *. And when you find a symmetry axis, you can mark it, by pressing* ✅ *. This way, you can draw all the symmetry axes and count them. This image has 1 symmetry axis.*

Now, you can go back to the main menu, by clicking ⬅ *.*
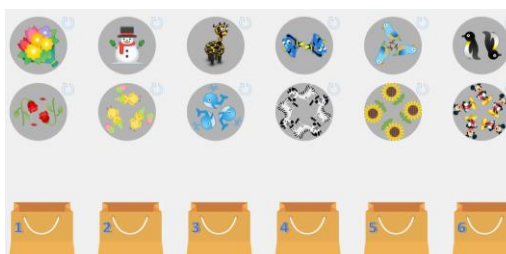
And you can drag the chosen rosette to the corresponding bag: number 1."

4. **Screen recording**. **Voice-over**:

"*With this app, in a playful and interactive way, it is possible to classify dihedral rosettes, those that have symmetry axes. We do it, by separating the rosettes according to the number of symmetry axes they have.*"

Game 4, Bag Game (II)

1. **Background**: a static image of the app.

- Simultaneously, the following **voice-over** is heard:

"*This is the app "Bag Game (II)" from the story "Mathina, the rosette game and the magic mazes"".*

- Then, the following **voice-over** is heard:

"*Mathina would like to keep all the rosettes which were presented. However, to get them, she still needs to solve a second challenge: the second Bag Game.*

The aim of this game is to separate the rosettes which don't have symmetry axis according to the number of rotation symmetries."

2. A **screen recording** is projected showing someone solving the app. **Voice-over**:

"*For that, you should drag each rosette to the corresponding bag: if the rosette has one rotation symmetry, it should go to bag 1, if it has 2 rotation symmetries, it should go to bag 2, and so on...*

3. **Screen recording**. **Voice-over**:

"*Now, we will see some tools available in the program.*

If in doubt about the rotation symmetries, you can click *.*

In this menu, you can rotate the red dot *. And when you find a rotation symmetry, you can mark it, by pressing* *. This way, you can mark all the rotation symmetries and count them. For instance, this image has 3 rotation symmetries.*

Now, you can go back to the main menu, by clicking *.*

And you can drag the rosette to the corresponding bag: number 3."

4. **Screen recording**. **Voice-over**:

"*With this app, in a playful and interactive way, it is possible to classify cyclic rosettes, those that do not have symmetry axes. We do it, by separating the rosettes according to the number of rotation symmetries they have.*"

Game 5, Mirror Maze

1. **Background**: a static image of the app.

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- Simultaneously, the following **voice-over** is heard:

    "*This is the app Mirror Maze" from the story "Mathina, the rosette game and the magic mazes"".*

- Then, the following **voice-over** is heard:

    "*While exploring Symmetry Fair, Mathina and Leo find themselves near some strange mazes. Mathina decides to explore, by herself, a peculiar one: a mirror maze.*

    The aim of this app is to solve that maze, by only looking at its reflected image in a mirror"

2. A **screen recording** is projected showing someone solving the maze. **Voice-over**:

    "*As in any maze, the goal is to start at the entrance (**here**) and end at the goal (**here**).*

    However, notice that, during the journey, the path gets more and more transparent, and, after a certain point, you won't be able to see it.

    The only path you can see is its image, on the right, in the "magic mirror".

    Now, to solve the app, you should draw, on the left side, the reflected image of a real path for the maze on the right."

3. **Screen recording**: someone finishing the first maze. **Voice-over**:

    "*At the end, a medal (gold, silver or bronze) may be awarded, according to your performance. The less you hit the wall, the better."*

4. **Screen recording**: someone solving the second maze. **Voice-over**:

    "*In the app, 3 mazes of different levels of difficulty are presented. Here, you can see the second maze, which is more difficult than the first one.*

    I'm going to solve it now."

5. **Screen recording**: someone solving the third maze. **Voice-over**:

"After solving the second maze, you move on to the third and last one, which, again, is more difficult than the previous one.

*Notice that, in this maze, you should not only avoid hitting the wall, but you should also avoid **these** monument drawings.*

Let's solve it now."

6. **Screen recording**: someone clicking the different buttons (this procedure occurs at the end of the third maze). **Voice-over**:

"Which tools are available in the program?

- *this button ( ) restarts the game;*
- *the number near this symbol ( ) indicates how many times you hit the wall;*
- *this button ( ) allows you to see the path in the original maze. Notice that, the less you click the button, the better is your performance."*

7. **Background**: the medals awarded at the end of the game. **Voice-over**:

"In this game, I've received 2 gold medals and a silver one."

8. **Screen recording**: someone restarting the game and playing the initial maze. **Voice-over**:

*"With this app, in a playful and interactive way, it is possible to explore mathematical notions related to a reflection in a line. In particular, there are two properties highlighted here: 1) a point and its reflected image form a line (**this one**) which is perpendicular to the reflection line (**this one**). You can also notice that 2) both points (**this one and this one**) are at the same distance from the reflection line."*