

Scripts for the films about the apps of the story *Stamping friezes* (11-14)

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 -- “11-14”, and a link to the app in the repository -- “https://...”.



Ending

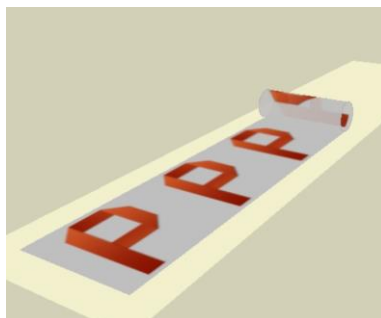
Background: black screen. **White text displayed:**

- 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, Stamping friezes with a "roll"...

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




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

“Completely by chance, Leo, Mathina and the wizard find a way to stamp friezes, by using a roll.

The aim of this app is to stamp friezes using a chosen image as a motif.”

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




“In this app, you can start by choosing an image and then watch the creation of a cylinder with that image.

If this cylinder has ink on it, it will leave a trail on the floor, in the form of a frieze. You can watch the cylinder stamping that frieze, by pressing .

Note that the frieze has, as a motif, the image you chose.”

2. **Screen recording:** someone clicking the different buttons. **Voice-over:**

“Which tools are available in the program?

- *to pause the animation, press .*
- *to play the animation, click .*
- *to go back, press .*

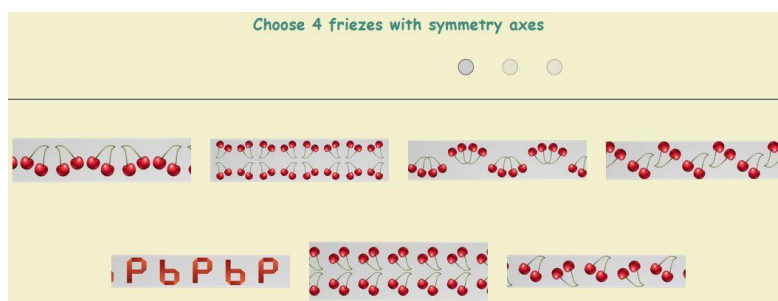
¹ The text in italic represents the content of the voice-over.

3. Screen recording. Voice-over:

“With this app, in a playful and interactive way, it is possible to watch the creation of a stamp, with a cylinder shape, for a frieze. Then, you can also watch the stamp imprinting the original frieze in the plane.”

Game 2, Separating friezes with symmetry axes

1. Background: a static image of the app.



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

“While examining the frieze images provided by the wizard, Mathina discovers that some of them have symmetry axes, but others don’t have any.

The aim of this app is to choose the friezes with symmetry axes.”

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

“You can choose a frieze by clicking on it. After choosing 4 friezes, you should press this button



.”

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

If, at one point, you make a mistake and select wrong friezes, 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:**

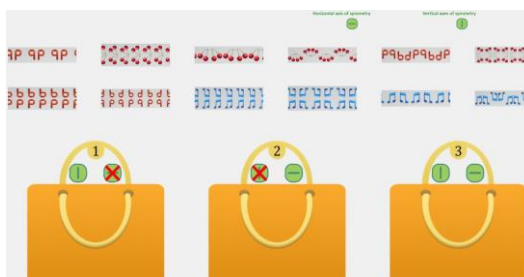
“In this game, I’ve received 2 gold medals and one silver medal.”

4. Screen recording. Voice-over:




“With this app, in a playful and interactive way, it is possible to identify the friezes which have reflection symmetry.”

Game 3, Separating the friezes with symmetry axes into 3 bags

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






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


“While examining the frieze images with symmetry axes, Leo discovers that there are 3 kinds of friezes: some only have vertical symmetry axes (like this one ) , others only have horizontal symmetry axis (like this one ) and there are others which have both (like this one ).

The aim of this game is to separate the friezes into 3 “classes”, according to the symmetry axes they present.”

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

“For that, you should drag each frieze to the corresponding bag. The frieze should go:

- to bag 1, if it has vertical symmetry axes, but no horizontal symmetry axis 
- to bag 2, if it has a horizontal symmetry axis, but no vertical symmetry axes 
- to bag 3, if it has both vertical and horizontal symmetry axes .

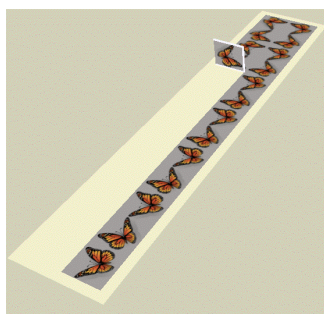
If you make mistakes, you can always correct them at the end. For that, you must click  .”

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

“With this app, in a playful and interactive way, it is possible to separate friezes according to the kind of reflection symmetry they have.”

Game 4, Stamping friezes with a "board"...

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



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

“After some experiments, Mathina discovers a way to stamp a special kind of friezes by using a two-sided board.

The aim of this app is to stamp friezes which have both vertical and horizontal symmetry axes, with a chosen image as a motif.”

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



“In this app, you can start by creating a board with an image you chose.


If such a board has paint, it will leave a trail on the floor, in the form of a frieze. In the app, you can watch the board actually stamping such frieze in the plane.

Note that the frieze has, as a motif, the image you chose.”

5. **Screen recording:** someone clicking the different buttons. **Voice-over:**

“Which tools are available in the program?

- to pause the animation, press  ;
- to play the animation, click  ;

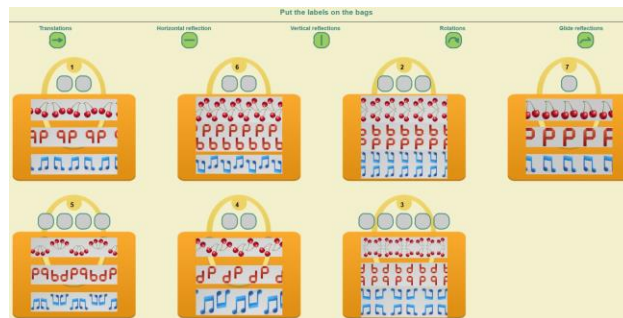
- to go back, press  ;

6. Screen recording. Voice-over:

“With this app, in a playful and interactive way, it is possible to watch the creation of a stamp for a frieze, which has the shape of a board. Then, you can also watch the stamp imprinting the original frieze in the plane.”

Game 8, Labeling the bags

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








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

“Mathina and Leo have separated the wizard’s friezes into 7 bags, according to their symmetry. But which are exactly the symmetries of the friezes in each bag?”

The aim of this game is to discover, for each bag, the symmetries shared by all the friezes in that bag.”



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

“Each frieze can have one of the following symmetries:




- *translation, represented by this symbol  ;*
- *horizontal reflection, represented by this symbol  ;*
- *vertical reflection, represented by this symbol  ;*
- *half-turn rotation, represented by this symbol  ;*
- *glide reflection, represented by this symbol  .*

Now, let’s examine the bags, one by one.






Starting with bag number 1, you may note that:

- as all friezes have translation symmetries, you can drag the translation symbol ,
- the friezes in the bag also have vertical reflection symmetries, so, you can drag the corresponding symbol: .

As there are no other symmetries in the friezes of this bag, you can move on to another bag, for instance number 2:

- again, as all friezes have translation symmetries, you can drag the translation symbol ,
- all friezes have a horizontal reflection symmetry, so you can drag this symbol ,
- all friezes also have glide reflection symmetries, so you can drag the corresponding symbol: .

As there are no other symmetries in the friezes of bag 2, you can move on to another bag. Let's choose number 3.

This is the bag where you find the largest number of different symmetries involved. In fact, the friezes in this bag have all 5 types of symmetries: translations () , horizontal reflection () , vertical reflections () , rotations () and glide reflections () .

The idea is to proceed this way for all bags. That's what I'm going to do now, but I'm going to make a mistake on purpose: above bag 4, I'm going to put a glide reflection (when it should be a rotation), and, above bag 6, I'm going to put a rotation (when it should be a glide reflection).

When you finish, and if you haven't succeeded in labelling the bags correctly, the app gives you feedback: the right icons remain in the bags, while the wrong ones are removed. So, now, you can correct your answer."

3. Screen recording. Voice-over:

"With this app, in a playful and interactive way, it is possible to distinguish the different types of friezes according to the symmetry they present."