

Transformational Geometry: Create an Animation

If your students are like mine, they want to know why they're doing what they're doing. Sometimes it can be difficult to find a real life connection with certain topics in Math - especially Transformational Geometry (Translations, Reflections and Rotations). However, this activity does just that!

Students will become animators!

Students will work to create an animation (flip pad and/or slide show) using the concepts of translation, reflection and rotation, on a coordinate grid. You can use this as an activity to drive instruction or as an assessment toward the end of the unit. Students can work individually, but with a partner works well.

The main activity is set up as a "flip pad". However, it's really cool when the flip pads are scanned into the computer and students create an actual *moving* animation. I've offered this as an "optional extension". If you can spare the time and have access to a scanner, it can make the activity even more engaging and motivating for students. They, in essence, become real animators! Meanwhile, you'll be hitting Math and Technology outcomes.

I've provided you with:

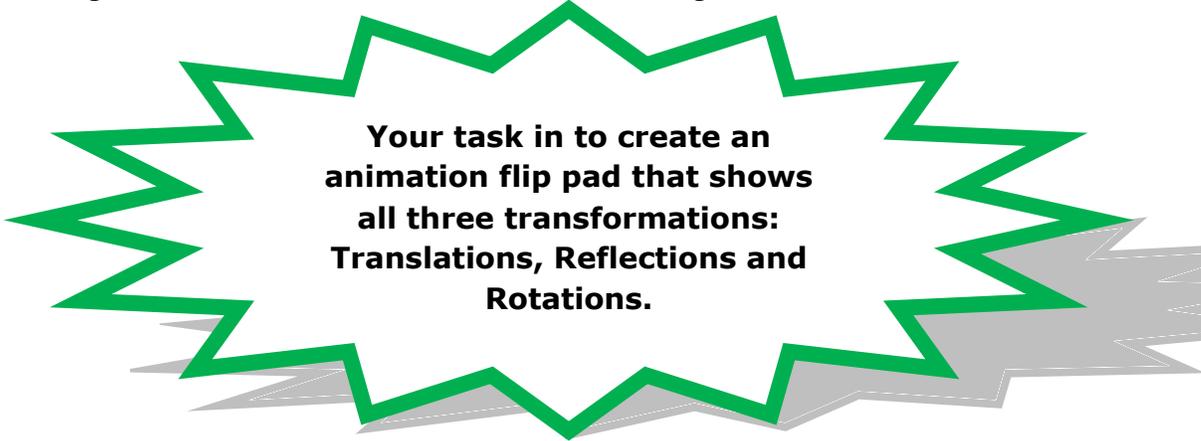
- ✓ The assignment sheets for students which explain what is expected of them
- ✓ A simple checklist for students to use as they create their animation. This checklist includes the outcomes that students will achieve with the assignment. Each "Yes" is one mark and those categories that are marked as "x2" are worth two marks for a "Yes" (total assignment is worth 20 marks). If you are simply using this as an activity and not an assignment, students can self assess with the checklist.
- ✓ A BONUS "Optional Extension" sheet for students. You may want to give students BONUS marks for creating a slide show. Every student may want to do a slide show, or you may provide it as an option for early finishers.
- ✓ A sheet providing students with the steps to making a slide show
- ✓ Blank 10 x 10 grid
- ✓ A student sample: A slide show of 27 slides that you can show students as an example of what you're asking them to do. I suggest that you even assess this sample with students, using the checklist to see what the students did well, what problems they may have had with their animation and what your students should consider as they create their flip pad animations.

NOTE:

Students need to put their coordinate grid in the exact same place on each sheet of paper for their flip pad, in order for it to work properly. You can give students the grid provided, photocopied multiple times. However, photocopying can sometimes be an issue. I have my students make their own grids on graph paper. This can be a lot of work and that's why working with a partner is great - it cuts the workload in half. Working with a partner requires communication and builds skills students will need in life. Let's face it, in reality, one animator wouldn't create an entire animation - people work in teams on the same project.

Create an Animation

How can you use Transformational Geometry to create an animation?



Your task is to create an animation flip pad that shows all three transformations: Translations, Reflections and Rotations.

- Your animation can be of whatever you like, but your main objective must be to show an object moving over a coordinate plane.
- Draw each step in your animation on a separate coordinate plane, on a new piece of paper. Make sure each plane is identical so that when you put all of the papers together, the animation will look the way you plan.
- Make a "title page" for your flip pad.
- You can put all 3 transformations into one flip pad or you can make multiple flip pads to show the different transformations.

Carefully plan where to draw each coordinate plane on the graph paper –You may want to make a demo first.

More sheets make a more effective animation.

Make sure that you staple all of your sheets IN ORDER.

You can keep the animation simple – the more details, the more difficult it will be to keep the animation consistent.

Be creative and have fun!

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Name: _____

Date: _____

ID # ____

Flip Pad Animation Expectations

You must:

Expectation	Yes (One mark for each check)	No
-Label the x and y axis		
- Label each quadrant correctly		
-Label the origin		
-Include at least one translation		
-Include at least one reflection		
-Include at least one rotation		
-Label the coordinates of one shape, translate it and label the new coordinates (x2)		
-Label how many units horizontally and vertically the shape was moved (x2)		
-Label the coordinates of one shape, reflect it and label the new coordinates (x2)		
-Identify the line of reflection		
-Label the coordinates of one shape, rotate it and label the new coordinates (x2)		
-Label the center of rotation		
-Include a Title Page/Cover		
-Color your animation		
-Staple your flip pad with the drawings IN ORDER		
-Create approx. 20 drawings		

Comments: _____

Total = $\frac{\quad}{20}$

BONUS

Optional Extension:

Create a real animation with your flip pad by making a Slide Show Presentation (5 Bonus marks)

Once you've created your flip pad, you'll have gained an understanding of what animators do to create many of the cartoons and movies that we watch every day.

To see your animation come to life (and to gain 5 BONUS marks), scan each page and create a Slide Show presentation, one picture per slide. When all of the individual pictures are scanned in and you play your slide show, your characters will move across the screen - just like in the movies.

Tips to Making Your Slide Show as Effective as Possible

- 1) Under the HOME tab, choose "Blank" or "Photo with caption" to insert your drawings
- 2) Under the ANIMATIONS tab, set Transition speed as "Fast" and click "Apply to all"
- 3) Under the ANIMATIONS tab, click "Automatically After", NOT "On Mouse Click" and set the time for 00:01 (one second).
- 4) Make sure that all of your animations are in order so that the characters/picture will move the way you intended
- 5) Scan in and save each of your drawings (in order) numbering them as you save them (pic1, pic2...etc)

Steps to Making a Slide Show



(After all of your illustrations are scanned and saved)

- 1) Open Microsoft PowerPoint
- 2) Choose a **Layout** (Blank or Picture with Caption)
- 3) Using the **Design** tab, choose a background design (SAME design for every slide)
- 4) Under the **Insert** tab, click **Picture**
- 5) Select your title page as the first picture
- 6) Add a border if you like (keep the same border for every picture if you choose a border).
- 7) Go back to the **Home** tab and click **New Slide**.
- 8) Insert your first illustration into Slide 2.
- 9) Go back to insert another **New Slide**, until you have all of your illustrations added to your Slide Show
- 10) Don't forget to **SAVE**
- 11) Under the **Animations** tab, make sure the following settings are chosen: "**Fast**" and "**Automatically After**". Set the time for **00:01**. Make sure "**On Mouse Click**" is not checked. Click "**Apply to All**".
- 12) Now you've created a basic slide show. Go to the **Slide Show** tab and you can watch your show "From Beginning" to see how it looks. It's when you do this, that you may find mistakes in your flip pad, that you may want to fix up!

