CS 1033

MULTIMEDIA AND COMMUNICATIONS

Lab 7: Animation

Remember to have your memory stick or a place in the cloud ready to back up your work in every lab!

Learning objectives for this lab
- Adjusting timing settings to play a slideshow as a simulated animation
- Inserting images and shapes into PowerPoint
- Applying path-based animations to images and shapes in PowerPoint
- Using the Animation Pane to select and customize animation segments
- Combining individual motion path to form more advanced animations
- Exporting a finished animation as an .mp4 video format
- Grouping elements together and applying an animation to a group

Introduction

Animations are an important form of multimedia for entertainment but also for advertising, education, and several other purposes. Microsoft PowerPoint is a great platform for creating animations. One way to create an animation is to use slides to mimic individual frames for a frame-based animation. Another way to use PowerPoint for animation is to create path-based animations, which are built-in to the program and make it very easy to add motion paths, rotations, and several other animation types.

Glossary

frame   an individual still image of an animation

frame rate   the number of frames displayed per second

ease-in   the animation effect in which an object accelerates (get progressively faster) rather than moving at a linear velocity

Activity 1

Installing PowerPoint on Windows

First, you will need to install PowerPoint on your Windows machine in order to create the animations in this lab. Luckily, the Microsoft Office suite, including Word, Excel, PowerPoint, Outlook, Access, and more are available for free to all Western students, staff, and faculty.

1. In Chrome, go to Western's Microsoft website (myoffice.uwo.ca) and sign in using your UWO ID (ex. jsmith246@uwo.ca) and UWO Password.
2. Find on the top right "Install Office". Click on it then click on "Office 365 apps".
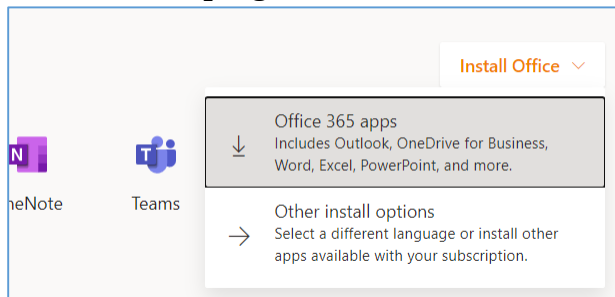
3. Click on the Setup file after it completes downloading.
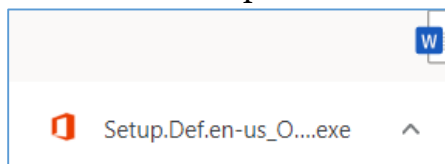

4. You might get a Run prompt. If you did, click on "Run".
5. Next you will get prompt for which you should click "Yes". This will start the installation.
6. Go through the installation steps.
7. After installation, start Office and sign in with the UWO account you use for Office 365: example jsmith246@uwo.ca
8. If you require more help on installation please visit this page: https://wts.uwo.ca/sitelicense/microsoft/homeuse.html

Frame-based animation

Before computers, animations had to be drawn one frame at a time with very subtle differences between one frame and the next so that there was an illusion of smooth motion when playing the frames in quick succession. This first exercise gives a look into frame-based animations to give you a better idea of early animations.

1. Open File Explorer in Windows and navigate to your **cs1033** folder on your memory stick. You should have several folders in there from previous labs. Create another folder and name it **lab07**.
2. Open http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab07/act1_template.pptx in Chrome.
3. Double-click on this file to open it in PowerPoint.
4. Immediately click File > Save As. Browse to your lab folder, i.e. **F:\cs1033\lab07** and save the file there with the name **act1.pptx**.
5. Look at the slide thumbnails along the left panel and observe the position of the rocket on each slide.
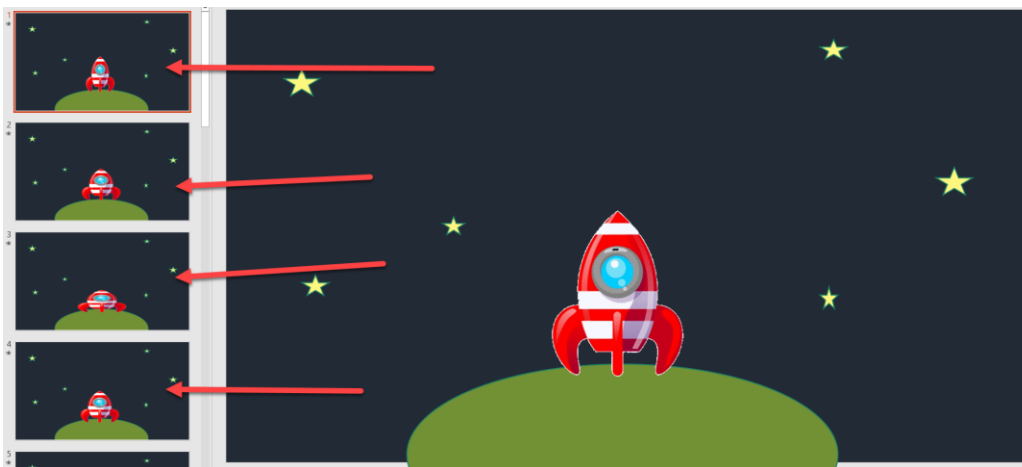

6. Select Slide Show from the tab bar and click on the From Beginning button as shown or hit your F5 key to begin the slideshow and then hit Enter every few seconds to advance the slides, and watch the rocket change with each new frame (slide).
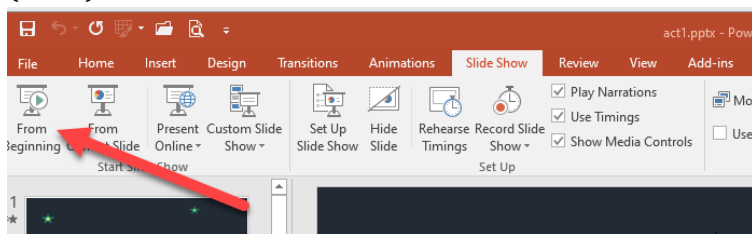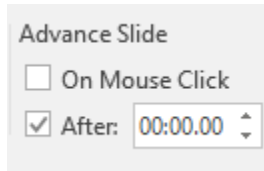

7. When the slideshow is finished, return to the editing mode and make sure Slide 1 (the top-most slide) is selected.
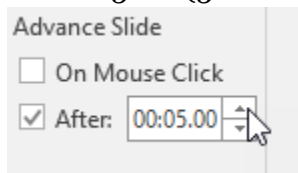
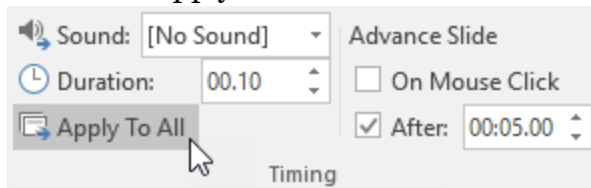8. Click the Transitions tab at the top.
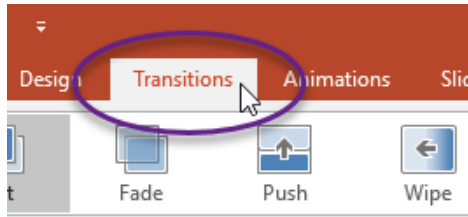
9. In the *Advance Slide* section, near the right side of the top Transitions banner, un-check the "On Mouse Click" box and check the "After" box.

10. In the time textbox beside "After", click the little up arrow to increase the time up to 00:05.00 (5 seconds).

11. Click the "Apply To All" button.

12. Click File > Save.
13. Hit F5 to play the slideshow but you might want to hit esc at some point to stop the slideshow as you will notice the frames move very slowly ☹.
14. As you probably noticed, this animation was very slow and choppy. This is because we are showing each frame for 5 seconds, meaning its frame rate is 0.2 FPS (1 frame / 5 seconds). This is a very low frame rate so we will experiment with increasing the frame rate (decreasing how long each frame is shown for).
15. Make sure Slide 1 is selected and the Transitions tab is still open.
16. In the "After" textbox that currently says "00:05.00", click the little down arrow to decrease the time to "00:01.00". Then click on the Apply To All button again.
17. Hit F5 and watch the slideshow through again. This time it will only take 17 seconds and the motion should look slightly better, but still not very smooth.
18. Repeat the previous steps to decrease the time, but notice the After textbox goes down to "00:00.00" which means the frames are technically not going to be shown for any time at all (although PowerPoint does show them briefly).
19. Click into the After textbox and edit the text manually so that it says "00:00.25".
20. Click on the "Apply to All" button.
21. Save the file.

22. Hit F5 and watch the animation play out.

Activity 2
Path-based animation

In this activity, you will apply path-based animations to make an airplane take off! This type of animation is easier than frame-based because the computer program handles most of the animation work and you just have to set it up with positions and settings.

1. Watch the completed animation video to see what you will be creating in this exercise: http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab07/act2.mp4
2. Open File Explorer and navigate into the lab folder, i.e. **F:\cs1033\lab07**.
3. Create a sub-folder within **lab07** and name it **images**.
4. Open http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab07/media/ in Chrome.
5. Download the plane image into your folder, i.e. **F:\cs1033\lab07\images**.
6. In PowerPoint, click File > New and select Blank Presentation.
7. Delete the default textboxes so that it is a blank slide.
8. Right-click on the empty slide and click Format Background…
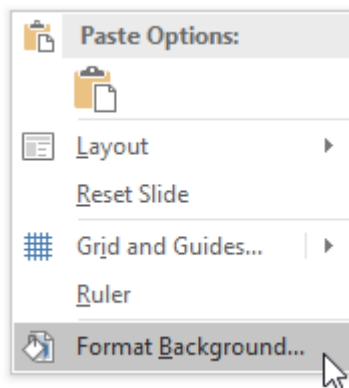
9. In the Format Background panel that comes up on the right, make sure the option *Solid fill* is selected. Click on the Color picker (paint bucket icon).
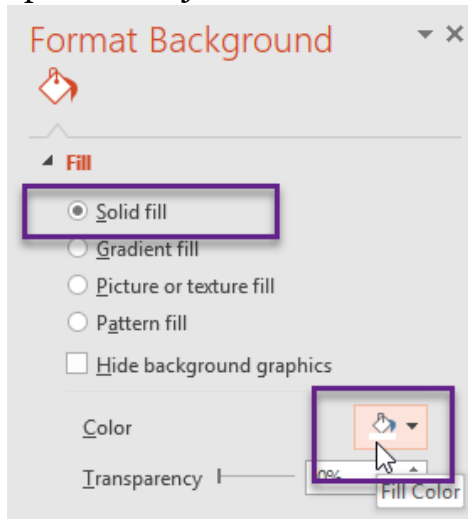

10. Select a light-medium blue shade (this will represent the sky). Push the little × beside "Format Background" to close the panel.
11. Click File > Save As.
12. Navigate into **F:\cs1033\lab07**.
13. Save the file with the name *act2.pptx*.
14. Click the Insert tab at the top and click Pictures below it.
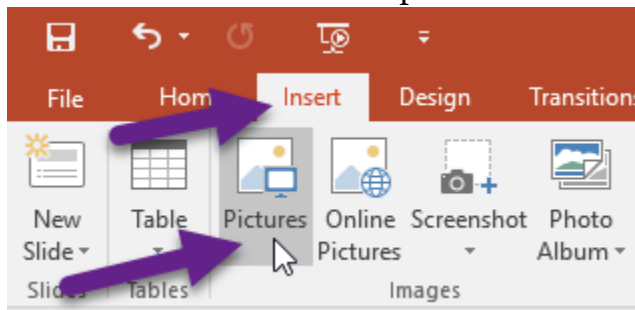
15. Navigate into the lab's images sub-folder, i.e. **F:\cs1033\lab07\images**.
16. Select *plane.png* and click Insert.
17. Make sure the plane image is selected (it should be by default)

18. At the top, click on the Format tab (under the Picture Tools heading).
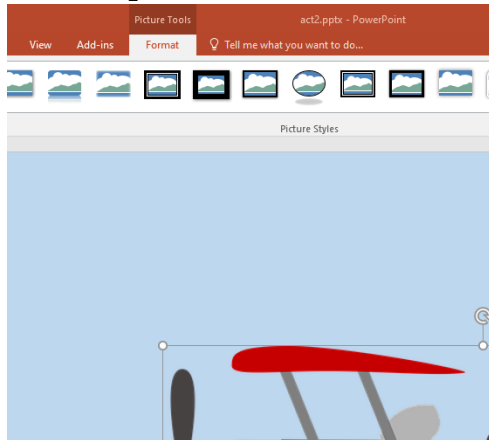
19. The plane appears large in the middle of the slide. Drag one of the corner white circles inward to make the plane smaller. Use the Height indicator on the right side of the Format panel to guide your resizing of the plane to about 1.5 cm (or 0.59"). (You will see the value change AFTER you release your mouse when resizing).
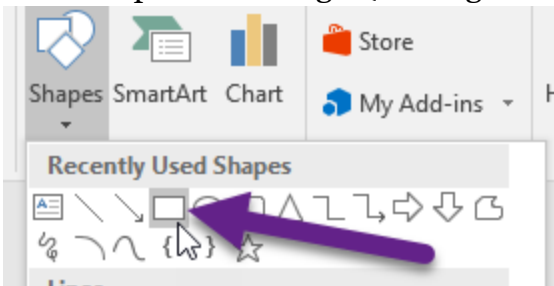
 OR
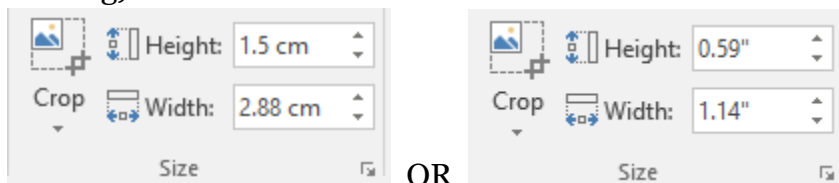
20. We also want the plane to face the right instead of the left. Near the top right, click Rotate > Flip Horizontal to make it face the right.
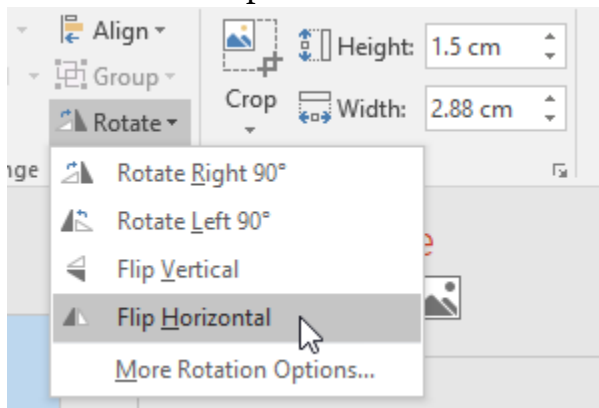
21. Drag the plane image to the bottom left corner of the slide.
22. Click into the Insert tab at the top again.

23. Click Shapes > Rectangle (rectangle shape icon near the start of the shape list).

24. Click and drag to create the rectangle on the slide. You can resize it shortly so for now just make it any size.

25. Drag the rectangle to the bottom-left corner of the slide. You should notice that the rectangle covers the plane image. Right-click on the rectangle and click Send to Back. Now the plane should be visible again above the rectangle shape.
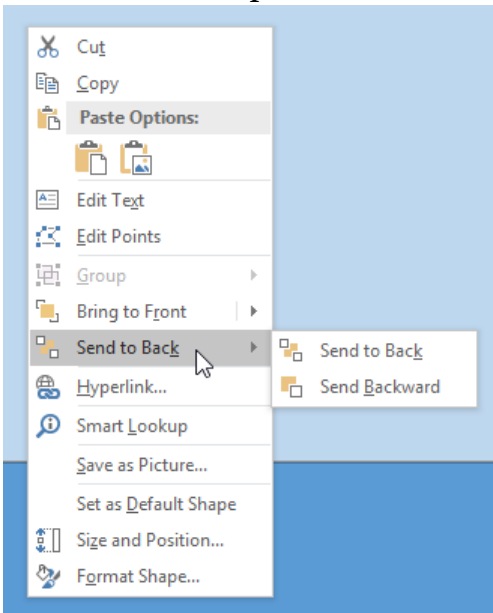
26. Click on the rectangle and resize it to the full width of the slide and about double the height of the plane.

27. Click the Format tab at the top if it's not already selected. In the Shape Styles section, click on Shape Fill and choose a gray shade to represent a runway.

28. Just underneath the Shape Fill is the Shape Outline setting. Click on it and select No Outline.
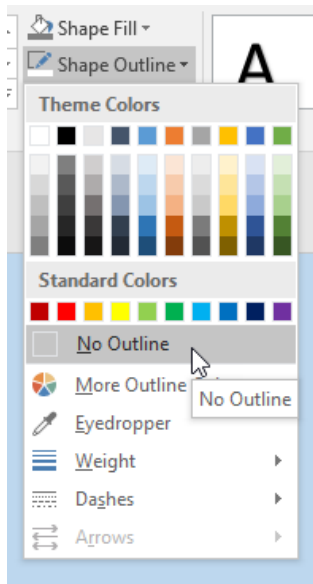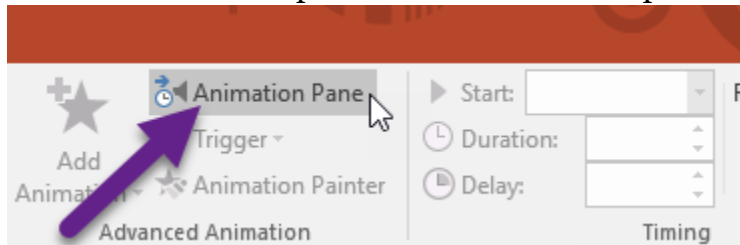

29. Click on the plane again and shift it up from the bottom just a little so that it's positioned about halfway up the runway vertically (still on the far left edge).

30. The scene should look like this:

31. At the top, click on the Animations tab. In the Animations panel, click on Animation Pane to open the main animation panel on the right side.

32. Click on the plane image. Make sure it is selected (i.e. the bounding box around it is visible). Also make sure the Animation tab is still active at the top.
33. Notice along the main animation panel there are many icons to quickly add several of the commonly used animations. On the right edge of that inner panel, click on the down arrow to see more animation options.
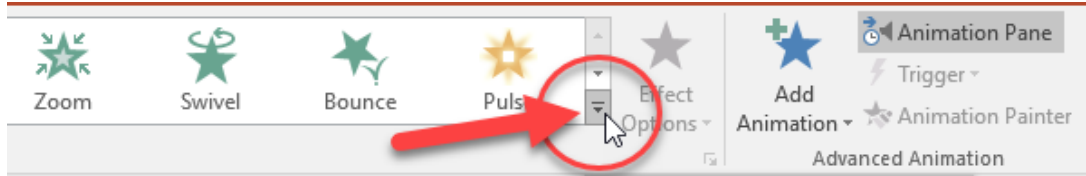

34. Clicking the *More animations* arrow opens a panel with more commonly used animations and buttons for even more options. Click on "More Motion Paths..."
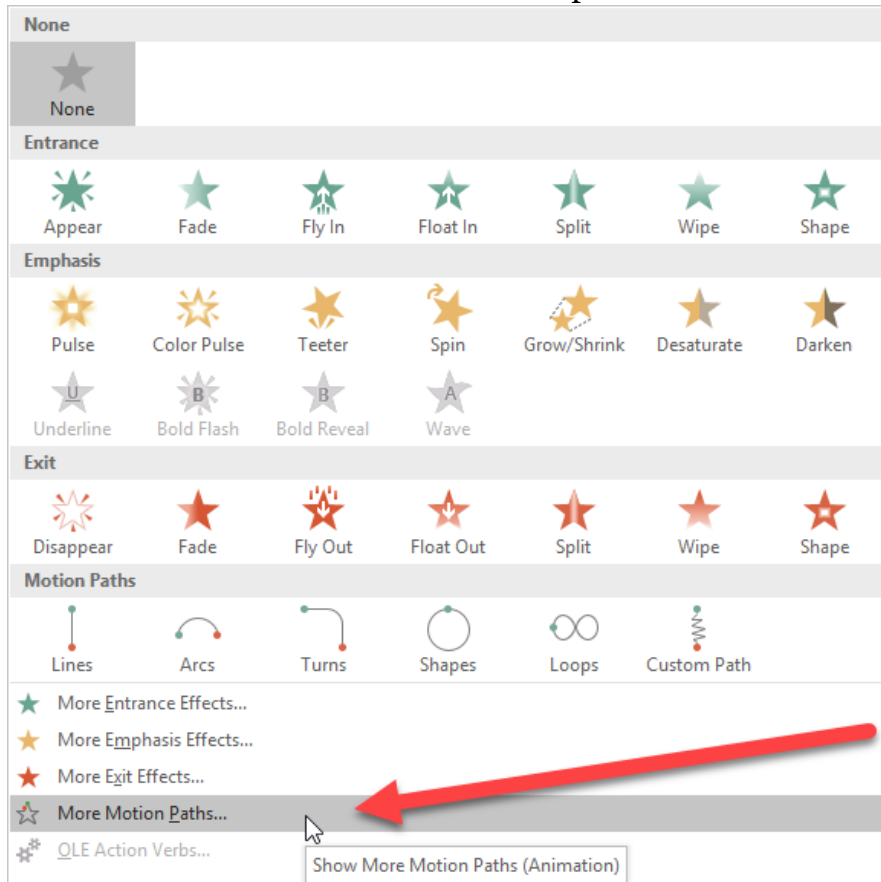
35. In the *Change Motion Path* pop-up window, scroll down and select the "Right" option. Push OK.
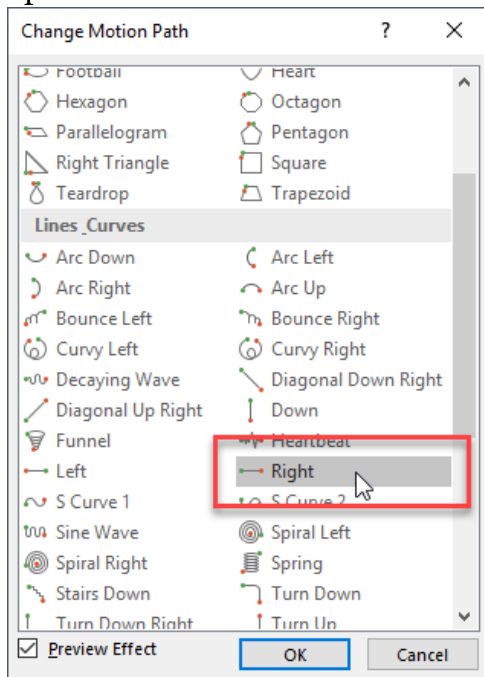

36. While this animation is selected in the Animation Pane, you will see a second copy of the plane image to the right of the original one. The second one is faded out and it indicates where the motion ends. This will be referred to as the "ghosted" plane image in subsequent steps.
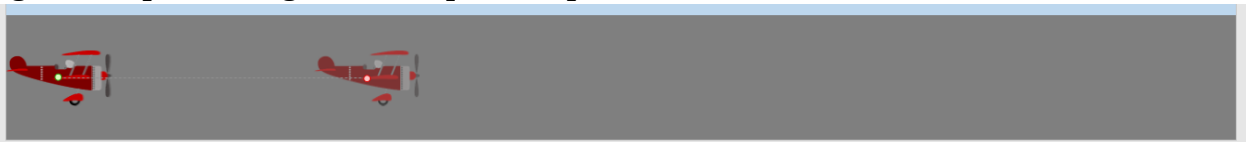
37. Click on this ghosted plane's middle circle (it can be a little finicky and you may have to click back on this ghosted plane a few times if you accidentally click off of it). Your cursor will turn into a diagonal, double-sided arrow to indicate that you're allowed to move it. Hold the Shift key (this keep it in a straight line) and drag this circle to the right so that it's roughly in the middle horizontally of the runway shape.
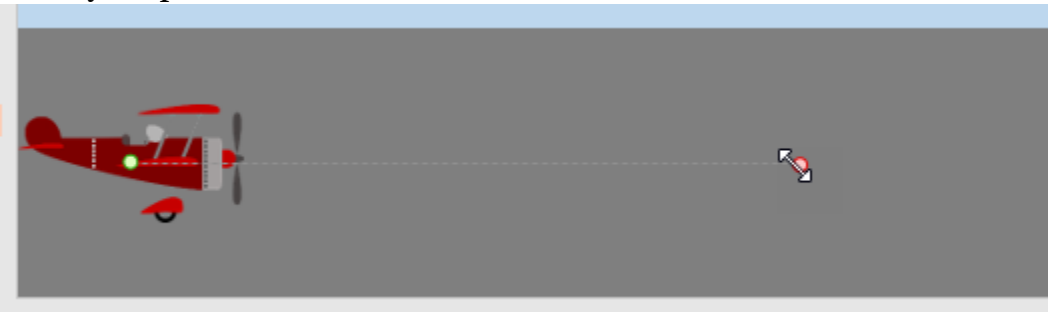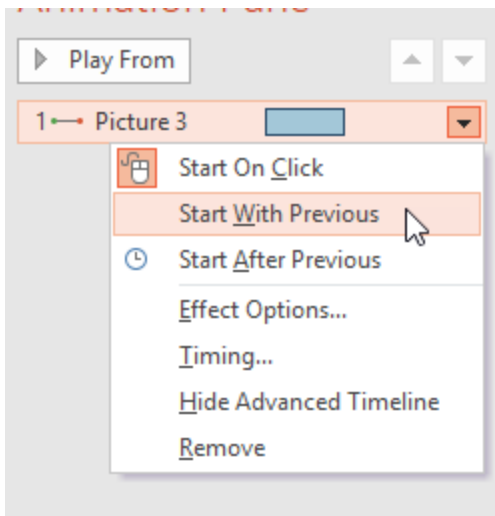
38. In the Animation Pane, click the *Play From* button to watch the motion play out.
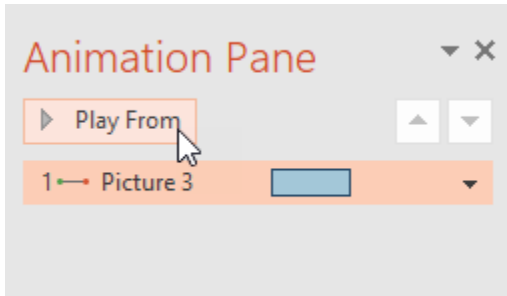
39. Underneath the *Play From* button is where the animation paths will be listed. There should be one there for now, representing the right motion you just added.

40. Right-click on this panel labelled Picture 3 (or it may end in a different number), and click *Start With Previous*.
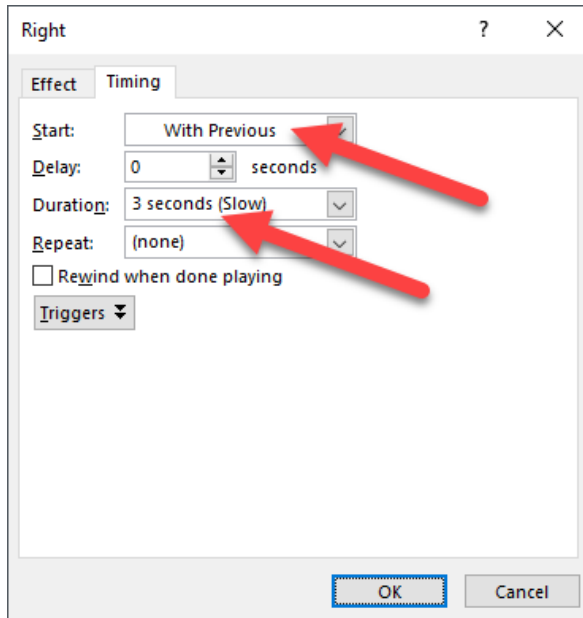
41. Right-click on it again and click on *Effect Options*.

42. Drag the slider for *Smooth start* all the way to the right (3 sec) and *Smooth end* all the way to the left (0 sec). This setting creates an ease-in effect on the plane.
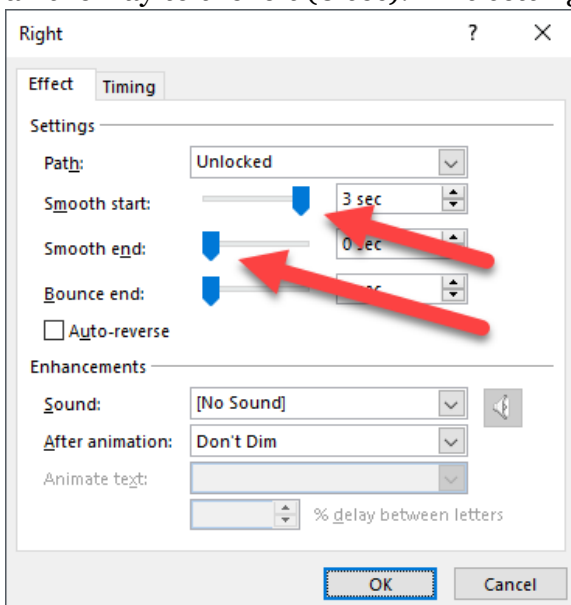
43. Click the Timing tab in this panel.
44. Set the Start to "With Previous" and the Duration to 3 seconds (Slow).


45. Push OK.
46. Click File > Save.
47. Hit F5 on the keyboard to watch the current animation. You should see the plane move to the right with an accelerating speed and then stop about halfway across.
48. When the animation is finished, hit the Escape key to return to the editing mode in PowerPoint.
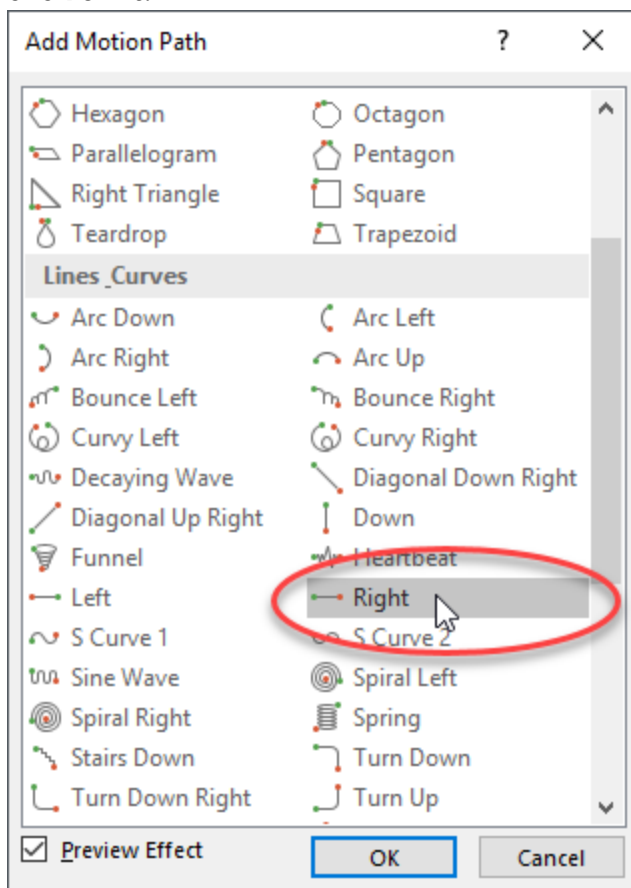49. Click on the plane image to select it.
50. Make sure the Animations tab is still active at the top. Click on Add Animation to expand the list of options and then click on More Motion Paths.
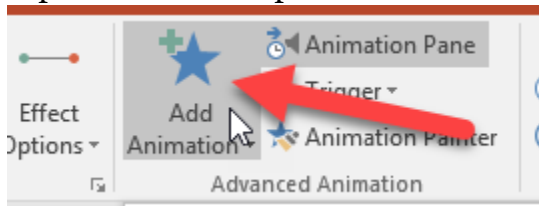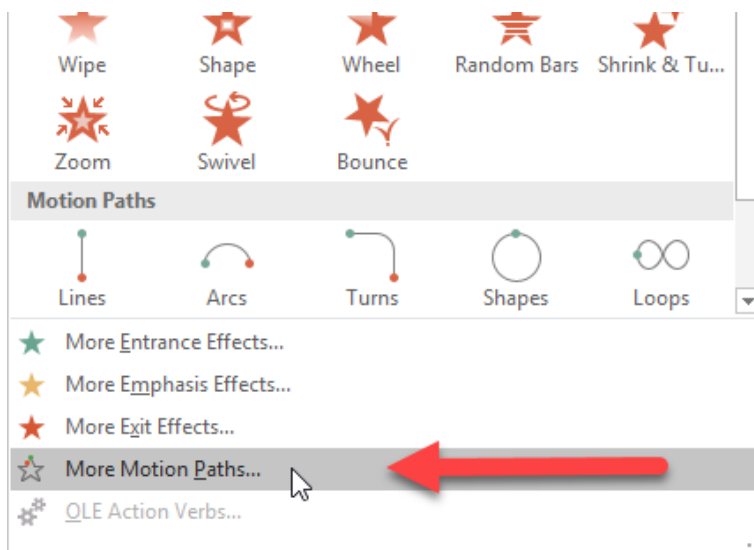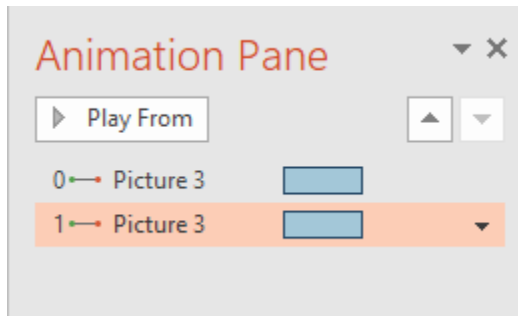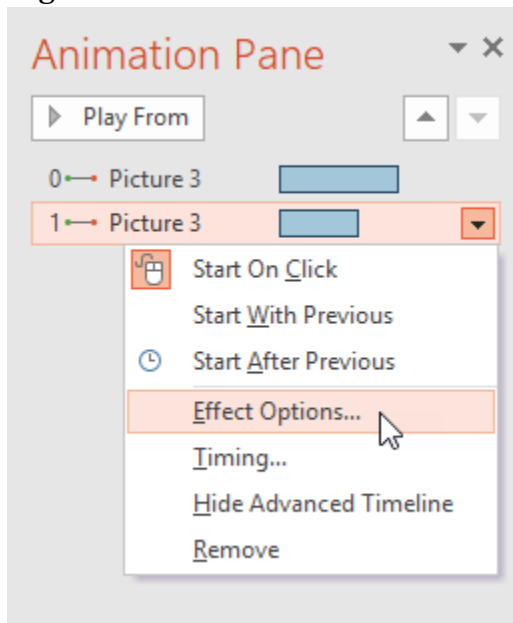
51. In the Add Motion Path pop-up window, scroll down until you see "Right" and click on it.

52. Notice there are now 2 items in the Animation Pane on the right.

53. Right-click on the lower animation item and click on Effect Options.

54. Drag the *Smooth start* and *Smooth end* sliders all the way to the left (0 sec).
55. Click on the Timing tab.
56. Beside Start, select "With Previous"
57. Enter "3" in the Delay textbox (we need to delay it so that it starts immediately AFTER the first animation leg finishes).

58. Select "2 seconds (Medium)" for the Duration.
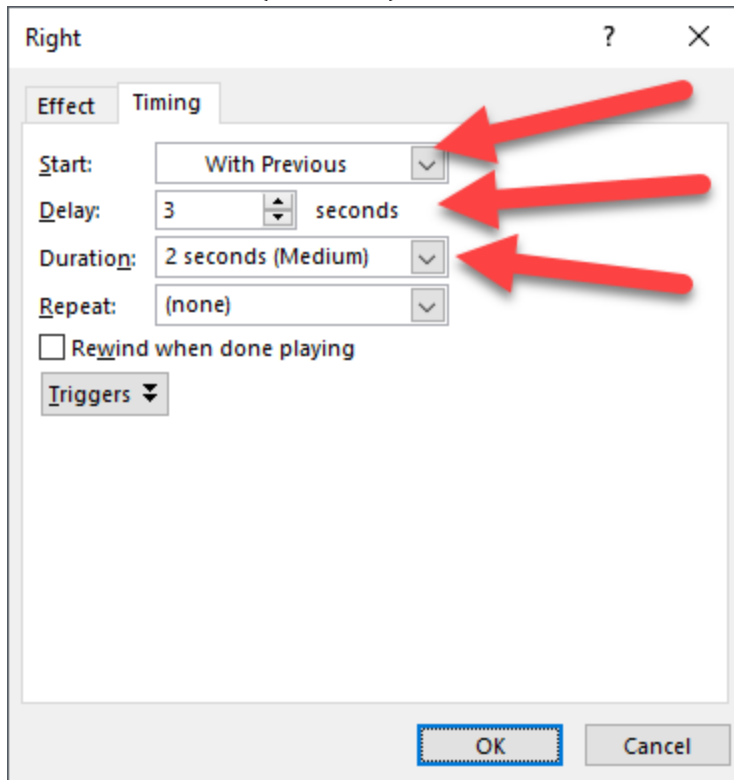
59. Push OK.
60. The Animation Pane should now look like this: (notice that the blue bars indicate the delays and durations of the individual animation segments).
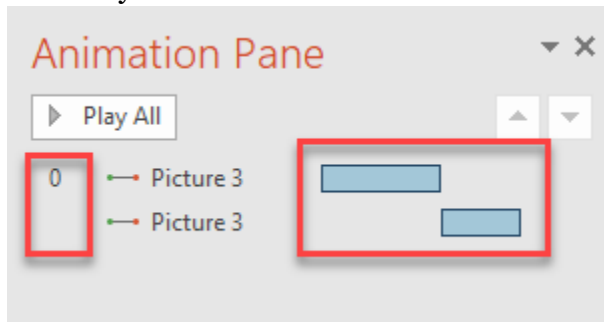
61. Click File > Save again. The next steps can cause frustration so it's recommended to save it now so you can Undo or reload from this point if needed.
62. Click on the lower animation item to ensure it is selected.

63. Hover your cursor over the "ghosted" plane image in the middle so the cursor turns into a double-sided, diagonal arrow.
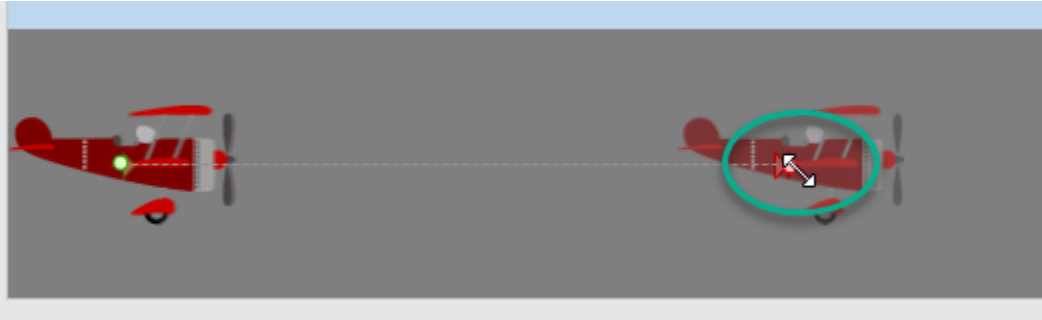

64. Click down on this plane and drag the plane up and to the right. Let go of the mouse drag when it's at the right edge of the canvas and near the top.
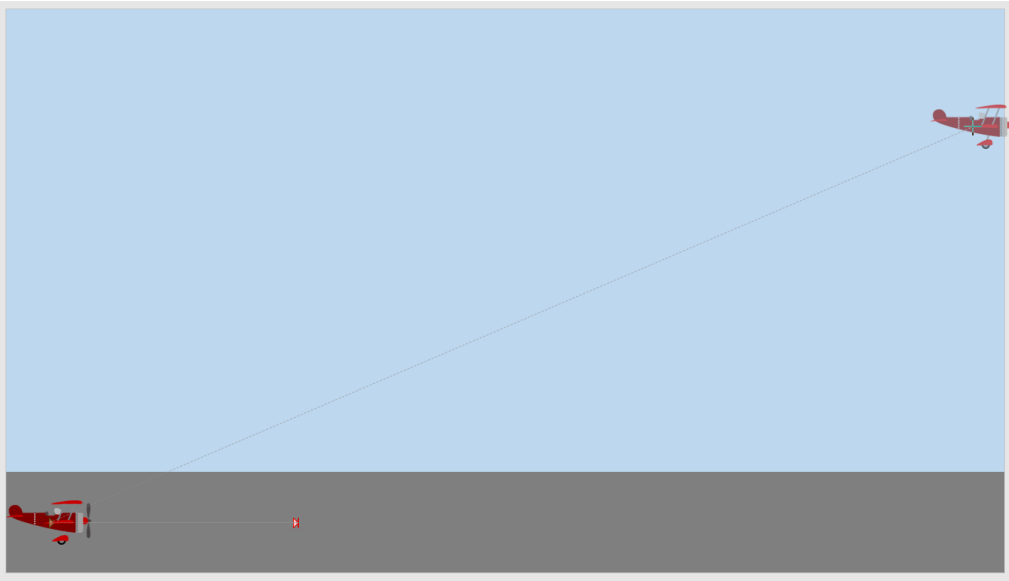
65. Hover your mouse over the original plane image on the left to see the same double-sided, diagonal arrow cursor.

66. Click down and drag this plane straight to the right and let go of it when it is on top of the red triangle icon in the middle.

67. Your canvas should now look similar to this:
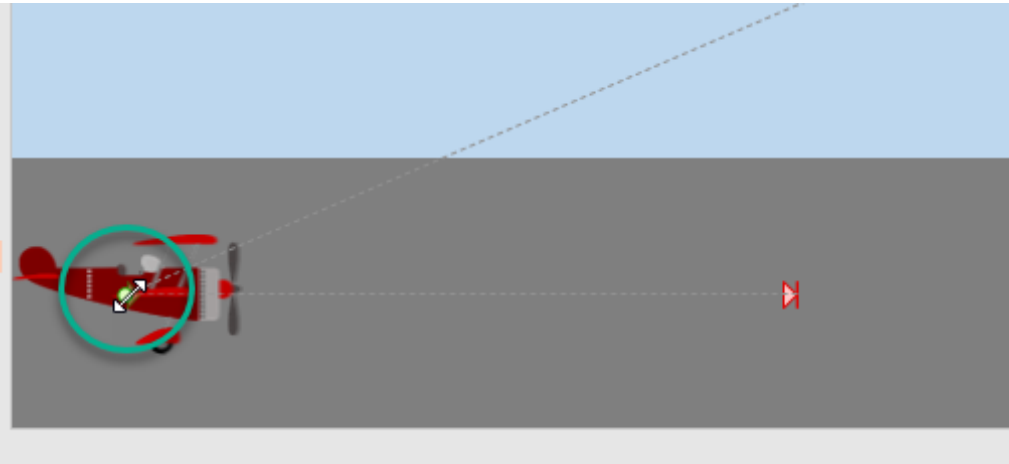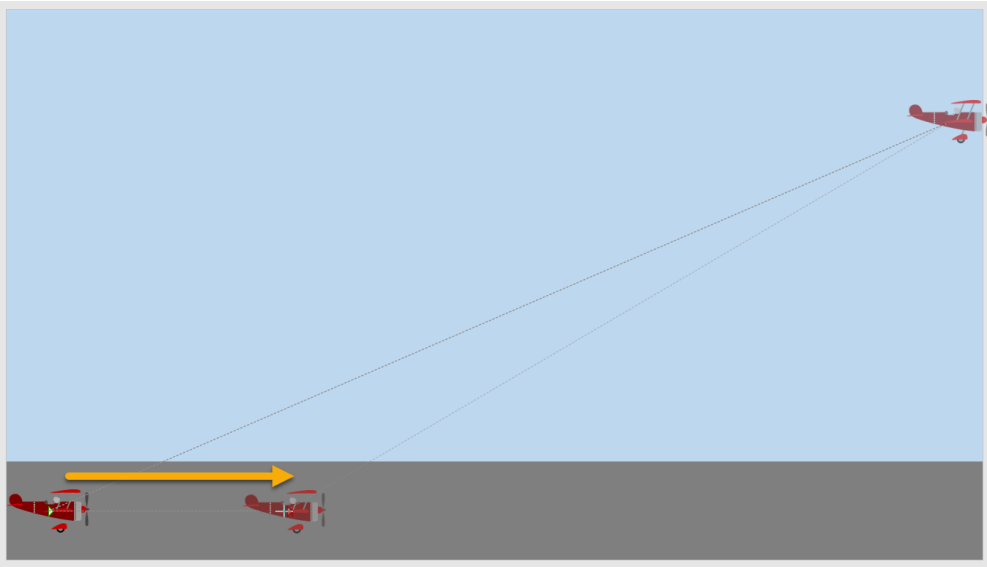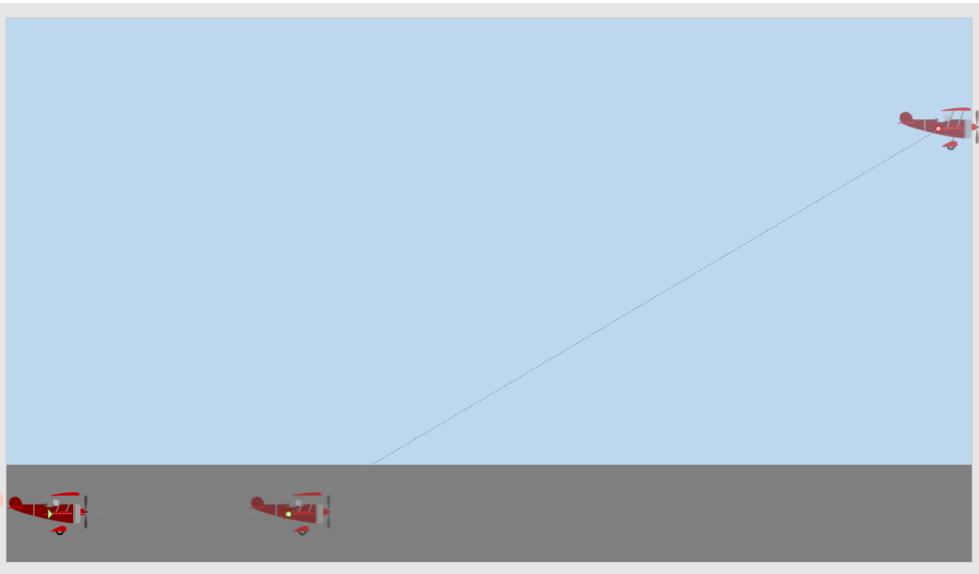

68. Push F5 to play the animation. You should see the plane accelerate to the right along the runway and then take off and fly up to the right based on the positions you set in the previous steps. NOTE: if it's not playing as expected, you may have accidentally moved the wrong plane image so hit Undo or close and re-open the file, and repeat the previous steps until this part is working properly.
69. Click File > Save.
70. Click on the lower item in the Animation Pane to select it.

71. At the top, click again on the Add Animation button but this time select the "Spin" animation option.
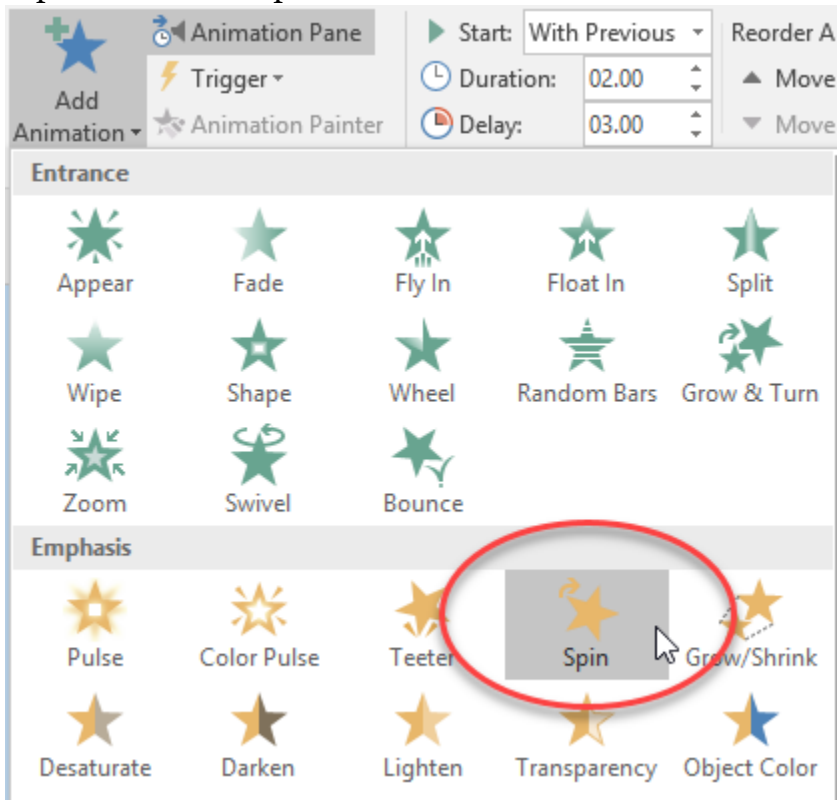
72. Right-click on the new item added to the Animation Pane, and click on Effect Options.

73. In the Spin options pop-up window, change the Amount to "Custom" and enter 30 in the custom textbox. Hit Enter to make this rotation change.
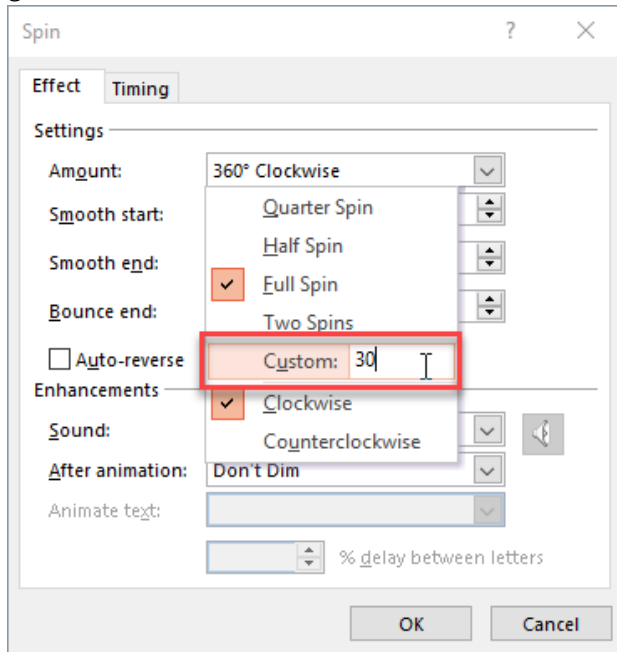
74. Open the Amount dropdown menu again and click on "Counterclockwise".
75. Make sure all the sliders are all the way to the left (0 sec).
76. Click into the Timing tab in this window.
77. Change the Start to "With Previous".
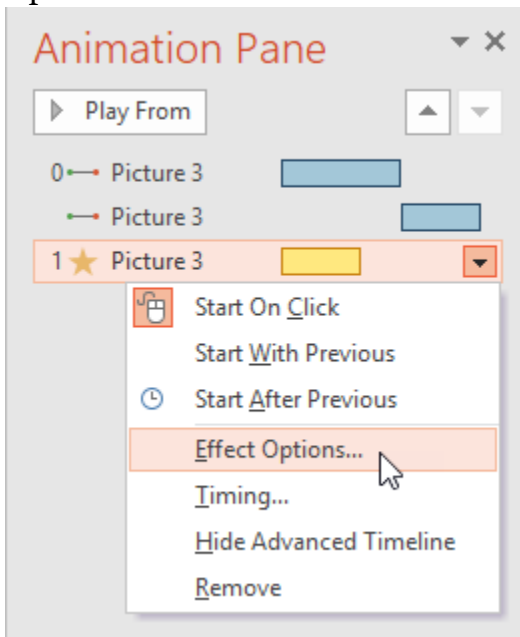78. Enter "3" for the Delay and select "2 seconds (Medium)" for the Duration.
79. Push OK.
80. Click File > Save.
81. Hit F5 to watch the full animation. The plane should accelerate to the right along the runway, then take off and begin rotating slightly upward as its elevation increases off the ground. The rotation and diagonal motion should happen simultaneously. If anything is not working properly, go back and make sure you added the last few steps correctly.

Activity 3
Another path-based animation

This is another exercise in path-based animations. In this one, you are simply using rotation animations to simulate an analog clock.

1. Open the following link in Chrome to download the template file for this activity:
   http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab07/act3_template.pptx
2. Open this template file in PowerPoint and immediately hit File > Save As.
3. Browse to your memory stick, i.e. **F:\cs1033\lab07** and save it there with the name **act3.pptx**. All the work in this exercise will be done in this **act3.pptx** file.
4. This template contains a clock face but it's missing the hands! You will be adding hands to it and then animating them to make it look like time is flying by.
5. Notice there is a textbox that says "Time in _____".
6. Delete the underlines in this textbox and type "Time in Tokyo, Japan (**your UWO ID**)" (example Time in Tokyo, Japan (**jsmith246**)).
7. At the top, click the Insert tab.
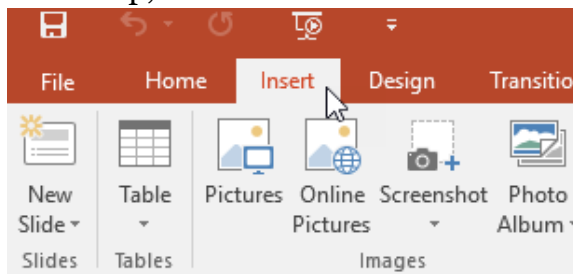
8. Click on Shapes and then on the Isosceles Triangle shape.
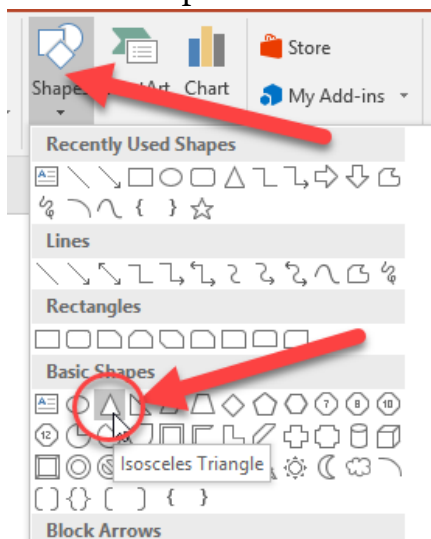
9. Click down in the white space on the left, but around the vertical position of the "11". Drag down so that the triangle being drawn ends around the same level as

22

the clock's center. Keep the horizontal distance very small so that the triangle is tall and narrow. Let go of the cursor when the triangle looks similar to this.
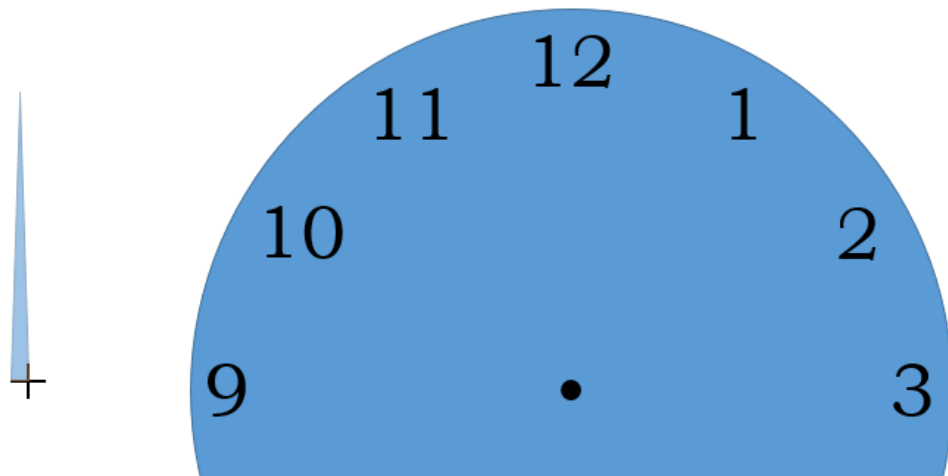
10. With the triangle shape selected, click "Shape Fill" under the Format tab at the top. Select the red colour to fill this shape.
11. Then change the "Shape Outline" to No Outline.
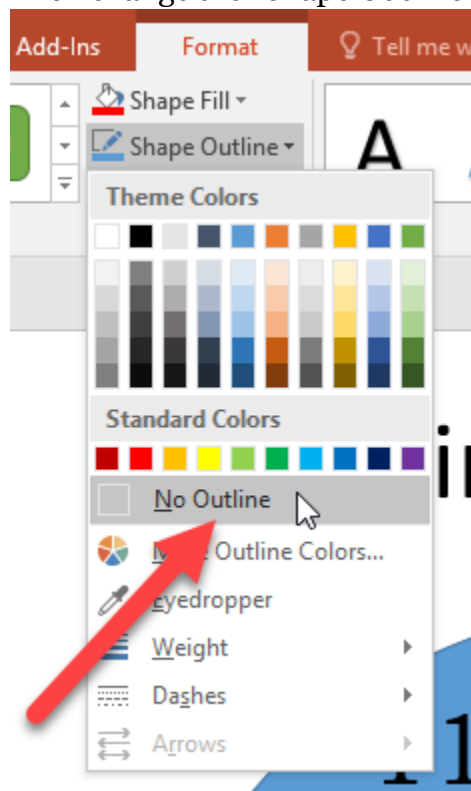
12. This red hand will be the minute hand on the clock.
13. Keep the red hand where it is for now so we can do an experiment with rotations.
14. Click on the red hand to select it.
15. At the top, click the Animations tab.

16. Beside the list of preset animation options, click the down arrow to expand the options list and then click on "Spin".

17. Hit F5 and then click on the canvas to see the rotation. Do you notice anything wrong with it? Rotations are performed with an anchor or fulcrum that stays still while 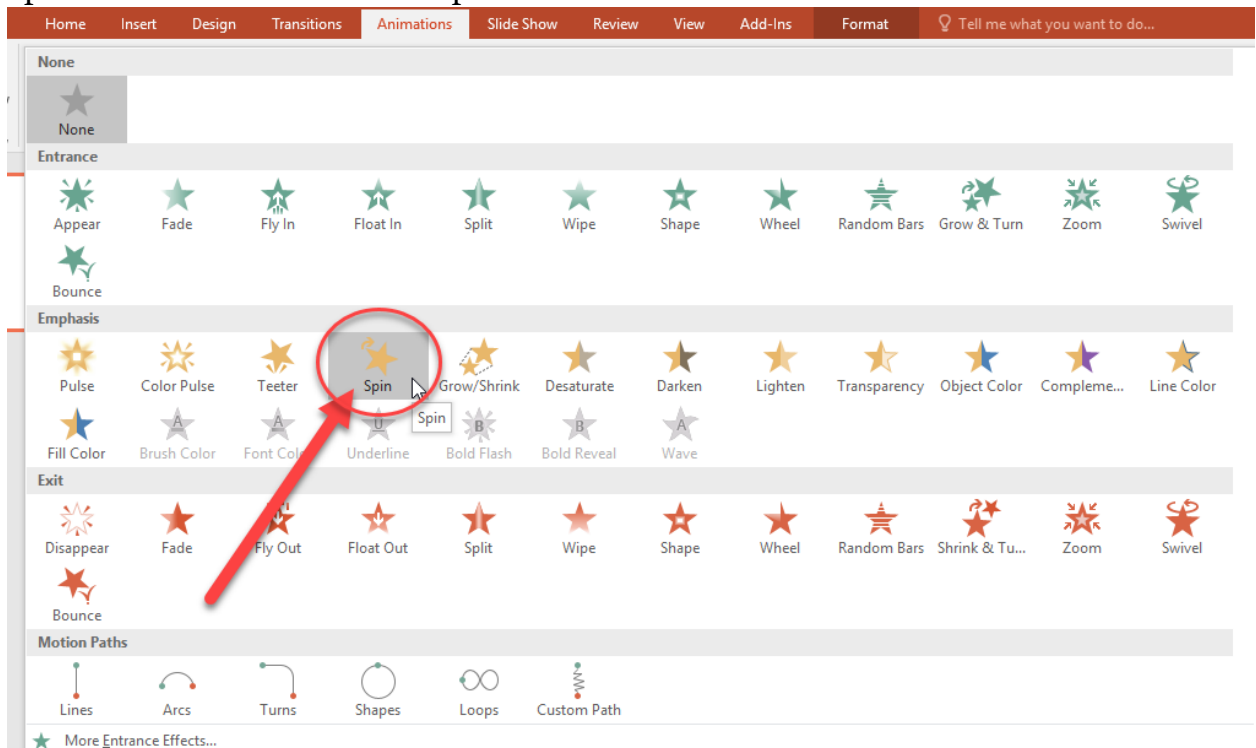the rest moves around it. PowerPoint only supports rotations around the middle of an object, but we need the anchor to be at the bottom of the triangle like a real clock hand. The next steps will be a way to get around this problem!
18. Click the Animations tab at the top, and then open the Animation Pane.
19. Right-click on the Spin animation listed there and click Remove.
20. Click on the red hand to select it.
21. Hit Ctrl+D to make a duplicate of this hand.
22. With the new, duplicate of the hand now selected, click the Format tab at the top.
23. In the upper-right corner, click on Rotate > Flip Vertical.
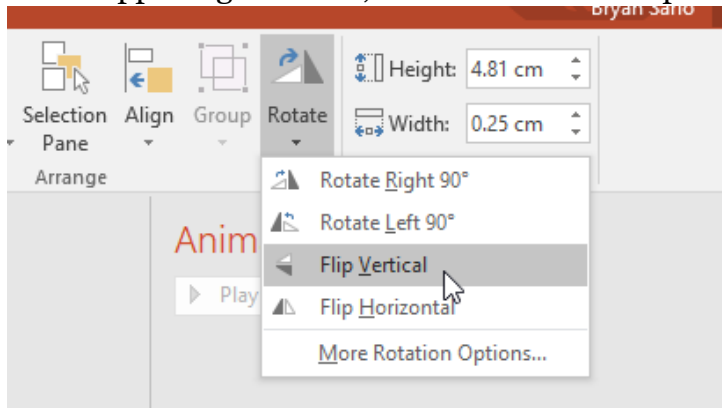
24. Drag the new, flipped hand to be immediately below the original triangle so that the two triangle bases are touching (NOTE: you may want to zoom in using the zoom slider in the lower-right corner).
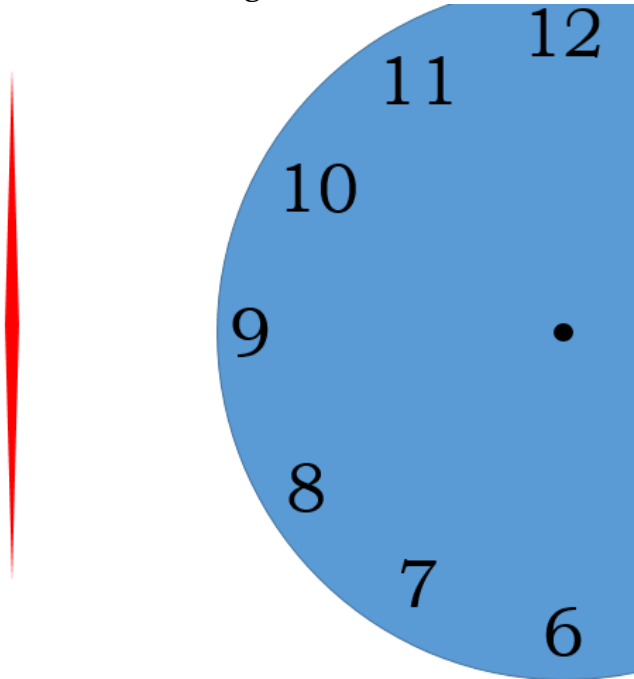
25. Click and hold your mouse in the white space just above and to the left of the top red hand(triangle) and drag down so that you select both pieces of the red hand at once.
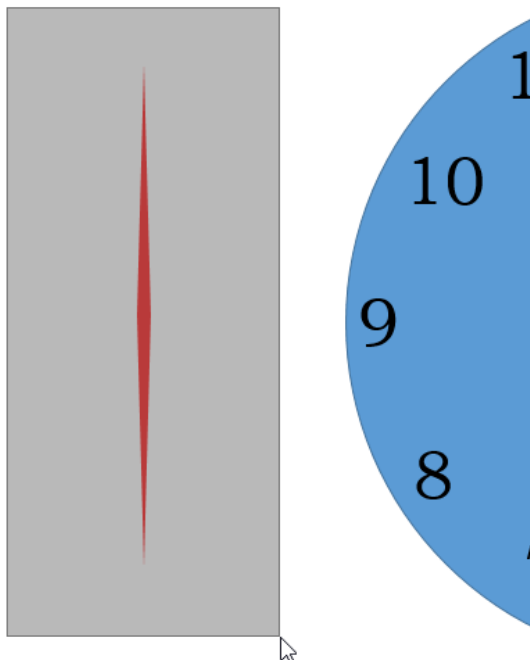
26. Right-click anywhere on the red hands and click Group > Group.
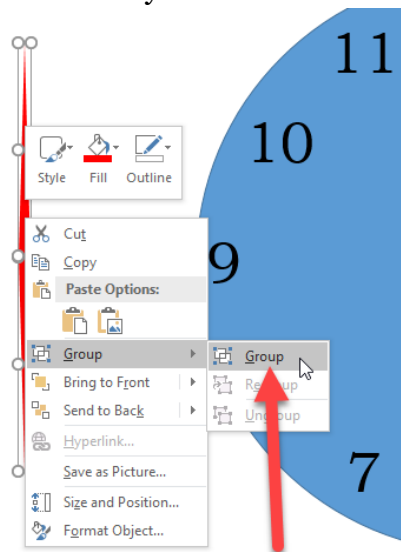
27. Keep the whole group selected but double click on the lower part of this hand. Change the "Shape Fill" to No Fill.
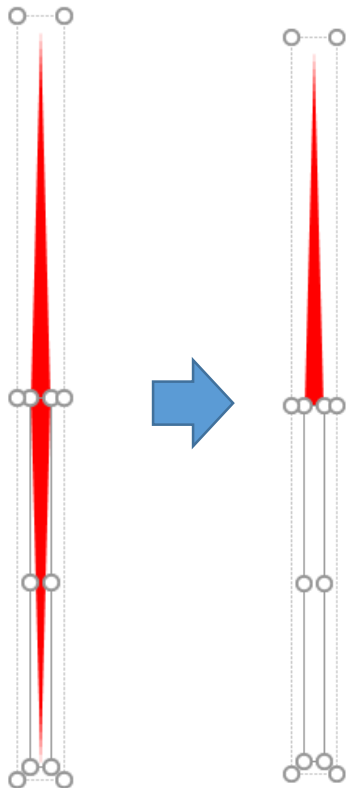
28. IMPORTANT – click OFF the red hand into the white area so that the red hand is not selected. Then click on it again so that is selected. It should only have 6 little

white circles around it as shown here:
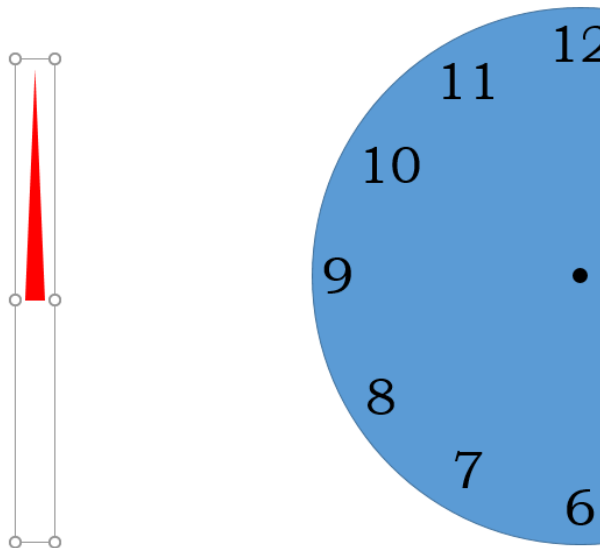
29. Then drag the red hand, which is now one object, and drop it in the circle such that the bottom of the visible red hand sits in the center of the blue clock circle. (NOTE: you may want to zoom in and use the keyboard arrows keys to place it more precisely).
30. Click in the white space near the top-left corner.
31. Click the Insert tab at the top and then click Shapes > Rectangle.

32. Draw a rectangle starting to the left of the "10" and down to the "9" in height, and keep it thin horizontally.
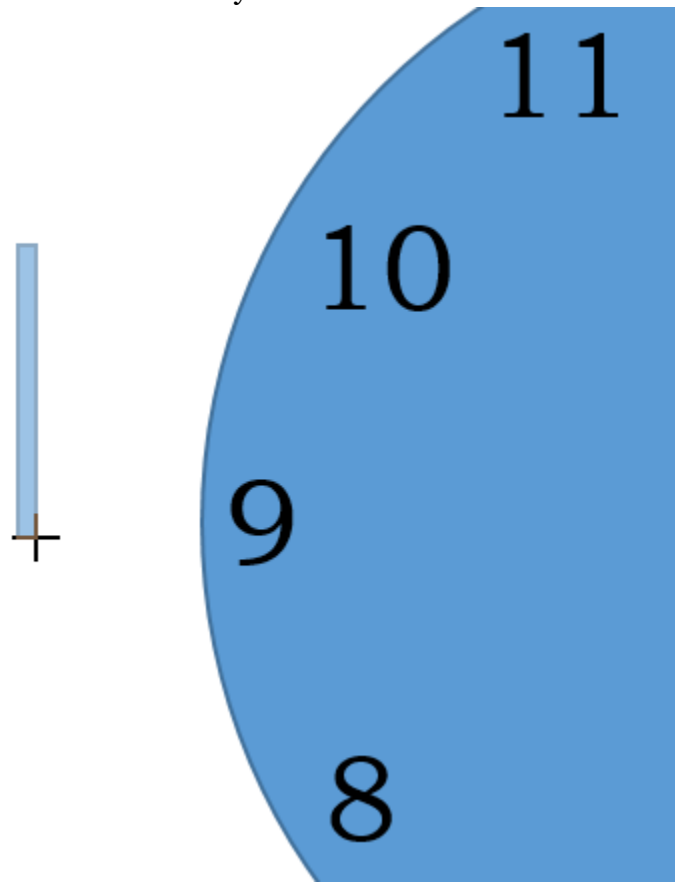
33. Under the Format tab at the top, change the "Shape Fill" to black, and the "Shape Outline" to No Outline.
34. Hit Ctrl+D on the black hand to duplicate it and then move the new copy directly underneath the original part of the hand.
35. Select both parts of the black hand (from just above and to the left, drag the mouse over both of them, then release, to select them both), right-click on it, and select Group > Group.
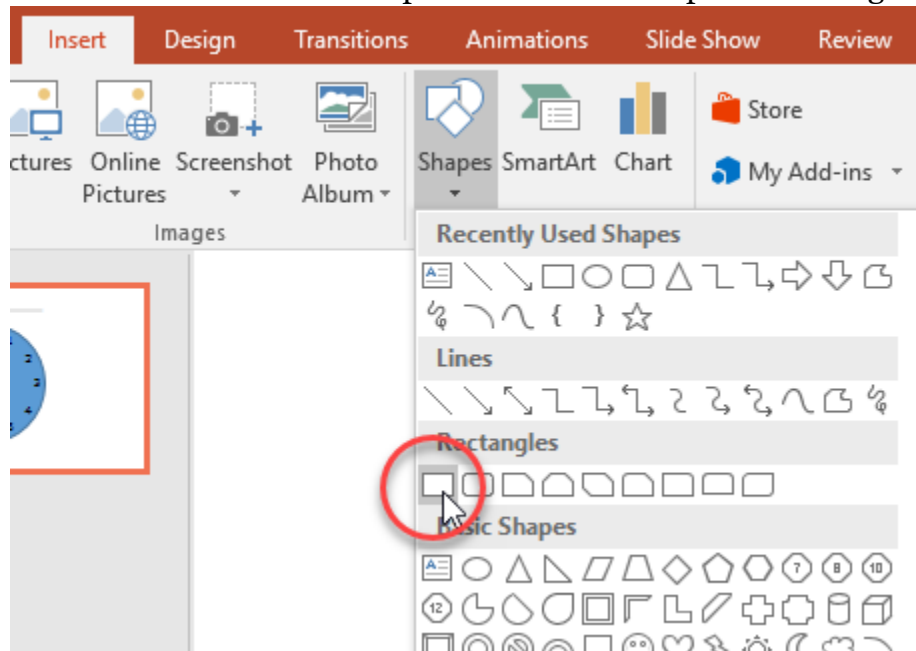36. Keep the whole group selected but double click on the lower part of this hand. Change the "Shape Fill" to No Fill.
37. IMPORTANT: Click in the white area to deselect the black hand and then click on the black hand again so that it just has 6 little white circles around it.
38. Then drag this grouped hand to the middle of the clock as well so that the bottom of the visible black hand sits in the center of the circle.

39. Your clock should now look similar to this:

Time in Tokyo, Japan

40. Click on the Animation tab at the top and open the Animation Pane.
41. Click on the red hand to select it.
42. Beside the list of preset animation options, click the down arrow to expand the options list and then click on "Spin".
43. Repeat this step on the black hand to add the "Spin" animation to it.
44. Click File > Save to save your work.
45. Hit F5 to see the animation at this point. You will have to click or hit a key to start each segment of the animation.
46. When the animation is finished playing, return to the main editing mode on the canvas. The animations are there but the settings need to be changed so that the hands move simultaneously, but at different rates, not one after the other.
47. In the Animation Pane, right-click on the top animation item click on Timing.
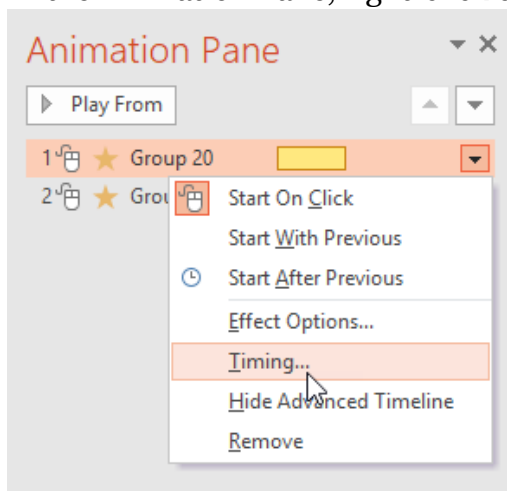
48. Change the Start setting to "With Previous" and the Duration to "1 seconds (Fast). Leave the Delay at 0 seconds so it begins immediately when the slideshow is run.
49. Beside Repeat, select "Until End of Slide" so that the rotation loops continuously.
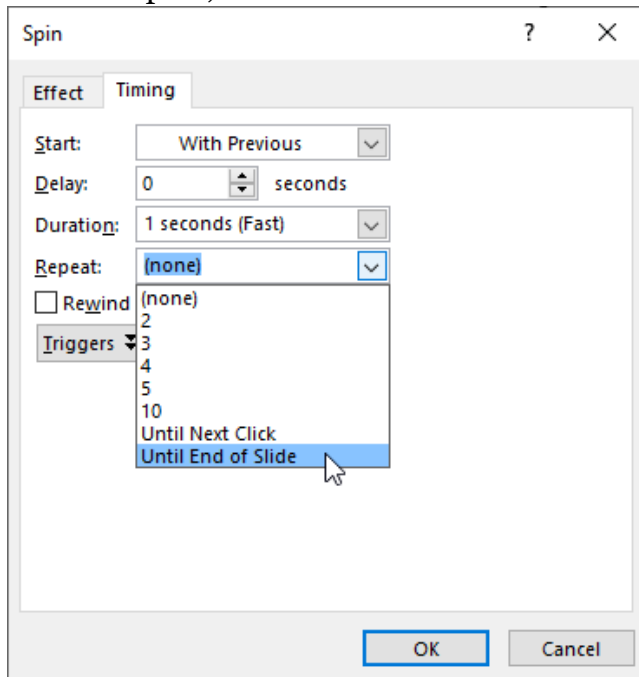
50. Push OK.
51. Right-click on the second animation in the Animation Pane and click Timing.
52. Make the same setting changes here **except** type in "20" in the Duration textbox.
53. Push OK.
54. Hit F5 to play the animation.
55. Click File > Save.

56. Click File > Export.
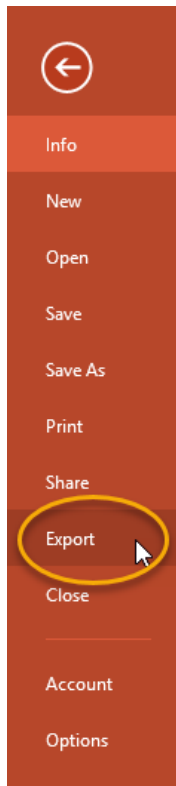
57. Click on "Create a Video" and then click the "Create Video" button.
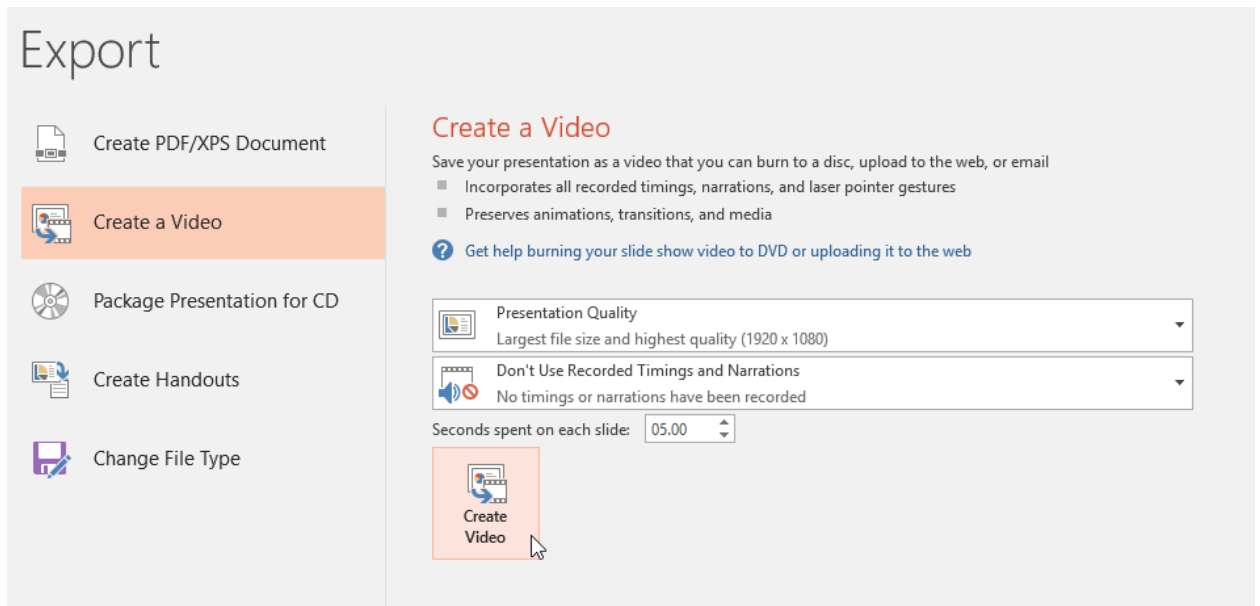
58. Save the animation video into your lab folder, i.e. **F:\cs1033\lab07** with the name *act3.mp4*. Note: it may take several seconds to save the video.
59. Open the File Explorer and navigate to your lab folder to find the MP4 animation video in there. Right-click on it and click Open with > VLC media player.

Activity 4

Simulating fireworks

This final exercise of the lab is similar to the last 2 exercises in that you will be using PowerPoint's path-based animations. You will be simulating fireworks by combining several different animation types.

1. Open the following link in Chrome to download the template file for this activity: http://www.csd.uwo.ca/~bsarlo/cs1033/labs/lab07/act4_template.pptx
2. Open this template file in PowerPoint and immediately hit File > Save As.
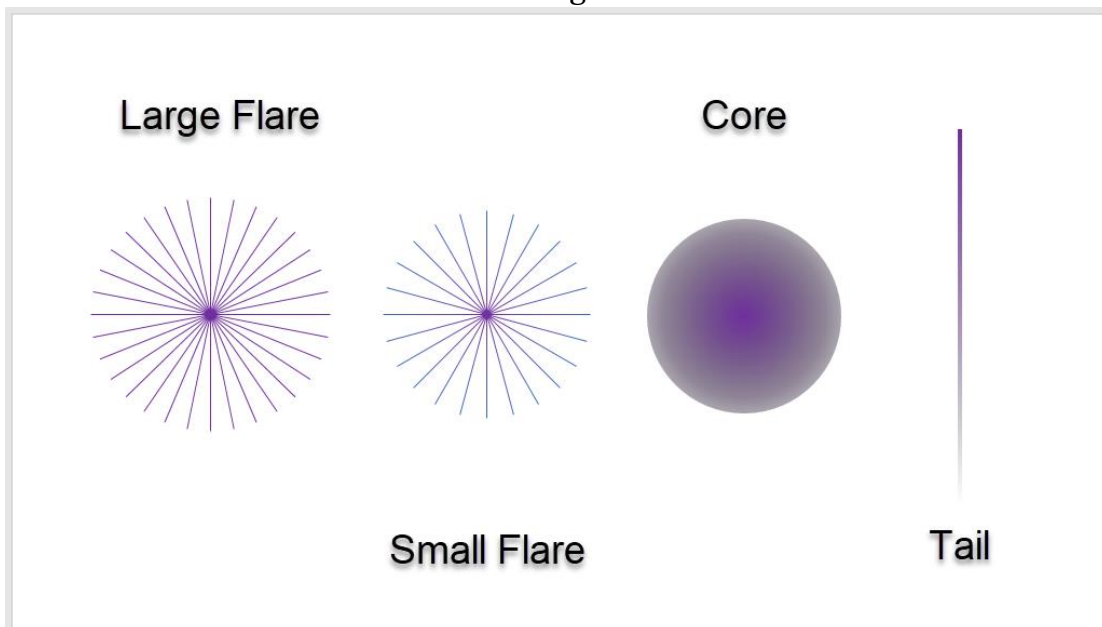3. Browse to your memory stick, i.e. **F:\cs1033\lab07** and save it there with the name **act4.pptx**. All the work in this exercise will be done in this **act4.pptx** file.
4. There are 4 elements provided to you on the slide: Large Flare, Small Flare, Core, and Tail. These terms will be used throughout this exercise's instructions.

All 4 elements are easy to create in PowerPoint simply by inserting default shapes (Large Flare is a 32-point star, Small Flare is a 24-point star, Core is a circle, and Tail is a rectangle) and using gradients and other settings to give them their appearances. These shapes were coloured purple to represent Western!

5. Click down on the Small Flare (try not to click on the little circle in the middle, just anywhere other than the little circle in the middle) and drag it over to the Large Flare so that they share the same center. PowerPoint will help lock it in place when you get the centers near each other.
6. Click down on the Core and drag it over to the two Flare shapes so that it is also centered in the same position as the Flares. PowerPoint show red dotted lines to

help you find this center when you get close to it.
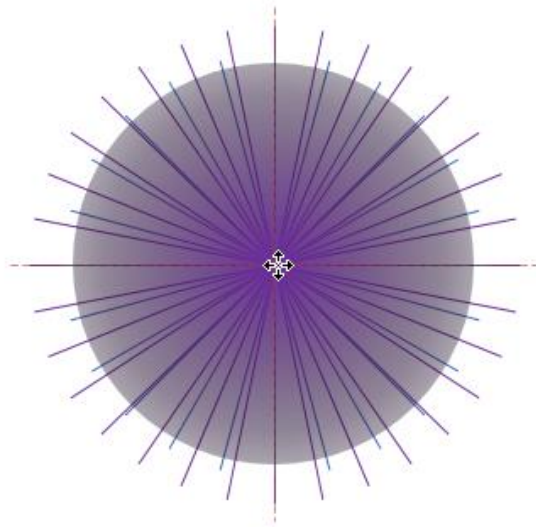
7. Drag your cursor around all 3 of these shapes to select them all at once. There should be a bounding box around each of them to indicate they are selected.
8. Right-click near the middle of these shapes and click on Group > Group.
9. Move this group to the top left corner of the PowerPoint slide.
10. Drag the Tail piece over so that the top of the Tail (purple end) is near the middle of the grouped shapes (it doesn't matter if it's not right in the center).
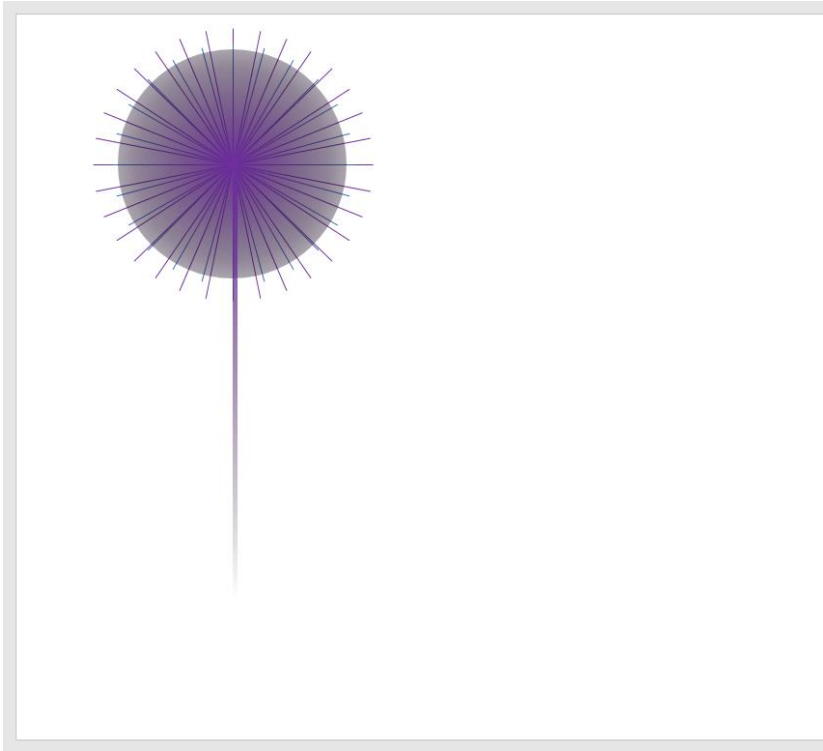
11. Before we animate the firework, the background colour should be set to black to make this look better. Right-click on the white part of the slide to bring up the

Format Background panel on the right.
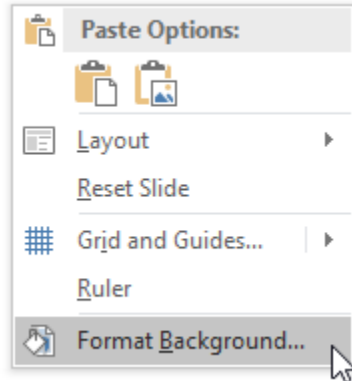
12. In the Format Background panel, ensure that "Solid fill" is selected and then use the Color selector to choose Black. You should already see that the firework is easier to see on this dark background.
13. Close the Format Background panel by clicking the little 'x' in the corner of this panel.
14. Save your work.
15. Click on the Animations tab at the top and then click Animation Pane to open it to the right.
16. Click on the Tail piece to select it.
17. At the top, click Add Animation, then from the Entrance category (the green ones) select Wipe.
18. Now click on the group of the other elements to select that group (don't double click on it – this will select one of the individual elements within the group which will cause problems with this animation).
19. Click Add Animation > Zoom (under the Entrance category).
20. Select the Tail part again.
21. Click Add Animation > Random Bars (under the Exit (red) category).
22. Select the other group of elements again.
23. Click Add Animation > Grow/Shrink (under the Emphasis (yellow) category).
24. Keep the group of elements selected. Click Add Animation and then click "More Exit Effects".
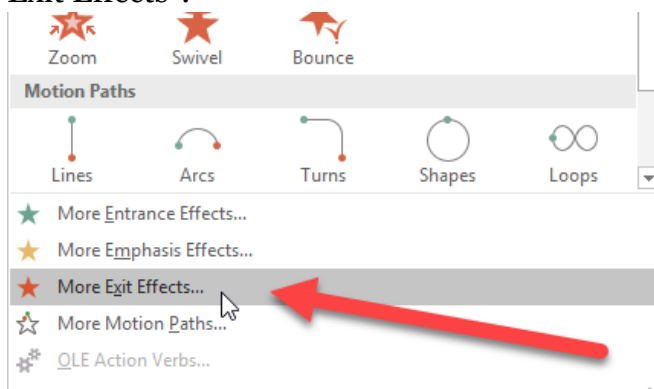
25. In the Add Exit Effect pop-up window, click on Dissolve Out and then hit OK.
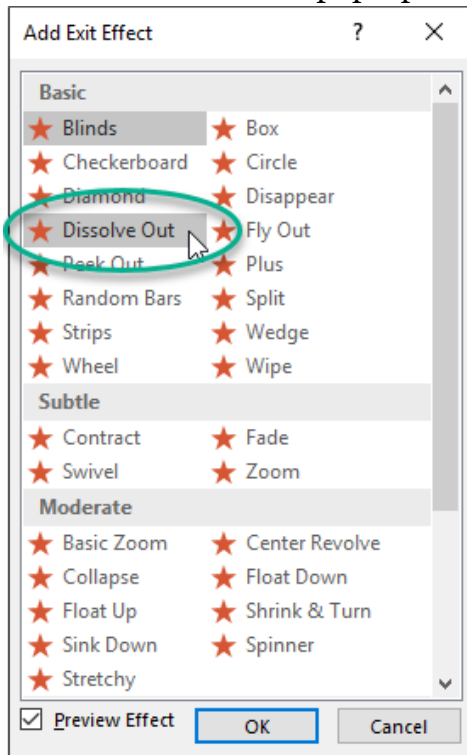
26. There should be 5 animation effects listed in the Animation Pane now.
27. Click on the #1 (top) animation item. Hold the Shift key on the keyboard and click on the #5 (bottom) animation item. All 5 items should be selected at once.
28. At the top, change the Start setting to "After Previous".
29. In the Duration textbox, type in "0.25" and hit Enter.
30. Click on the middle animation item. At the top, change its Start setting to "With Previous".
31. Save your work.
32. Hit F5 to watch the animation. You should see the tail animate upwards and then fade away as the main part of the firework explodes.

33. Drag around the entire firework (including both the Tail and the grouped elements above it). Right-click on the firework and click Copy.
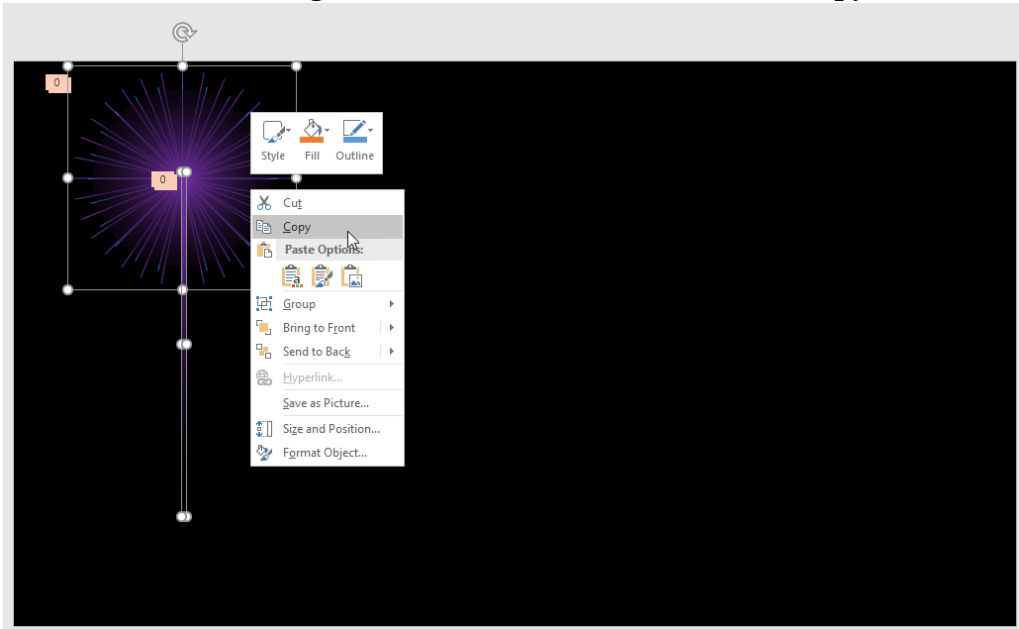
34. Click onto the slide so that nothing is selected.
35. Right-click on the canvas and click the left Paste option labelled "Use Destination Theme" (do not click the other Paste option or the animations won't be copied).
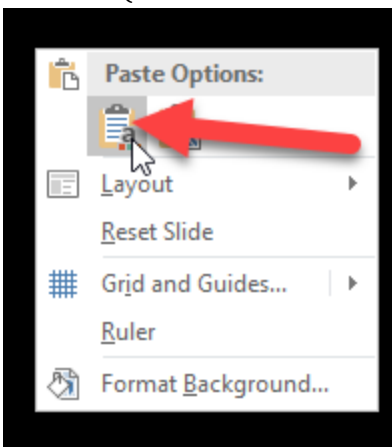
36. The duplicate firework will paste on top of the original one so drag it over to another place on the canvas.

37. Paste another copy of this firework and move it somewhere else. Try using different heights each of the fireworks.

38. Save your work.
39. Hit F5 to play the animation. The 3 fireworks should play out, one after another.
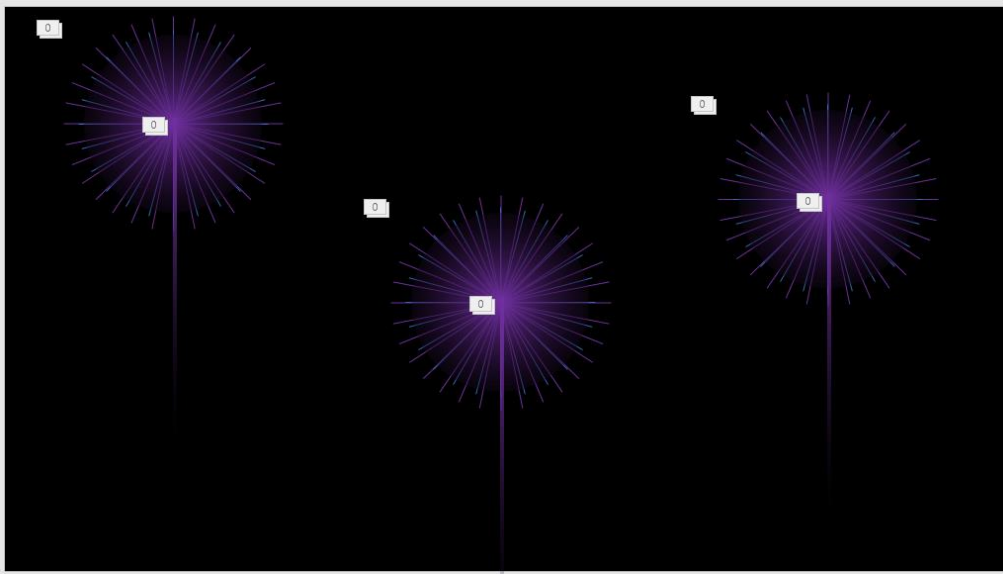40. Click File > Export.
41. Click on "Create a Video" and then click the "Create Video" button.
42. Save the animation video into your lab folder, i.e. **F:\cs1033\lab07** with the name *act4.mp4*.

Uploading Lab7 Folder

Now we are going to upload your Lab7 activities to a webserver to make sure they actually work.

1. Use the Windows search tool (magnifying glass at the bottom of the Windows bar) to find and open WinSCP. You will be connecting to the Gaul server to upload the webpage to a webserver in order to test the webpage you just created on the World Wide Web and make sure it looks correct.
2. Enter the following information into WinSCP:
   a. File protocol: SFTP
   b. Host name: cs1033.gaul.csd.uwo.ca
   c. Port number: 1033
   d. User name: Your Western User ID
   e. Password: Your Western Password
3. Click Login.
4. When connected, you should see your lab01-lab06 folders (called a directory in WinSCP) that you created a few weeks ago on the Remote side (right panel). On the Remote side (the right side), create a new directory (folder) called **lab07**.

Make sure this folder has its Permissions set to 0755. This is usually the default, but if, for some reason it's different, change it to 0755 now.

5. Click into the **lab07** folder.
6. In the Local side (left panel), navigate to **F:/cs1033/lab07**. Select **all the files** created from your Lab7 work and drag it across to the Remote side to upload it.
7. Open a new tab in Google Chrome and check that the following websites are working as they should and are downloadable:
    a. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act1.pptx
    b. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act2.pptx
    c. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act3.pptx
    d. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act3.mp4
    e. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act4.pptx
    f. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act4.mp4

where **youruserid** is your own Western username.

Lab7 OWL Submission

1. In your Internet browser, go to https://owl.uwo.ca and login with your UWO username and password.
2. Go to your CS1033 OWL site.
3. On the left-side panel, click on **Week By Week**. Click on the **Week 7** button, then click on the **Lab 7** button, this will take you directly to **the Lab 7** submission area in Owl.
4. In the textbox under Submission, copy and paste your submission link which is:
    a. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act1.pptx
    b. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act2.pptx
    c. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act3.pptx
    d. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act3.mp4
    e. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act4.pptx
    f. http://cs1033.gaul.csd.uwo.ca/~**youruserid**/lab07/act4.mp4
5. Click on Submit.

Remember to save all your Lab07 folder on your backup memory stick or cloud storage!