



Teaching world time zones: Chart the hour

For centuries, humans have marked time by the position of the sun. The sun rose in the east, moved across the sky, and set in the west. Solar noon occurred when the sun was directly overhead. However, solar noon in one location could occur in the middle of the night in another. What could we do to solve this problem? The answer came through establishing worldwide standard time zones. There are 24 time zones, each 15 degrees of longitude wide. The starting point for the standard time zones is the Prime Meridian. Travelers moving westward from the Prime Meridian move their clock back to earlier times (minus 1 hour for each time zone), while those moving eastward change to later times (plus 1 hour for each time zone). A traveler going around the world would have to change not only the time but also the date. Establishing the International Date Line solved this problem. Travelers moving westward advance their calendars one day as they cross the International Date Line (Saturday to Sunday), and travelers moving eastward move their calendars back one day (Saturday to Friday).

A large university that has a major department in International Relations and Diplomacy has asked you as a GIS educator to provide them with a lesson that will explain worldwide standard time zones. The university has asked that the course be online and that it be a hands-on experience. ArcGIS Online is the software that is available at the university.

Build skills in these areas

- Opening Scene Viewer
- Searching and adding layers
- Configuring layers
- Saving a Scene
- Using a Scene to answer questions

What you need

- Account required
- Estimated time: under 30 minutes



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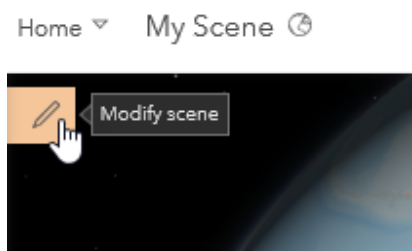
Open Scene Viewer, search for and add layers, configure, and save.

1. Sign into your [ArcGIS organizational account](#).
2. Click Scene on the top Ribbon.
3. Take time to learn the navigational buttons:
 - a. Click the Home button to return to the initial position.
 - b. Click + to zoom in. You can also use your mouse and scroll wheel to zoom in and zoom out or press and hold the middle mouse button and move down or up to zoom in or out.
 - c. Click the Pan button to pan. Click and hold the left mouse button and drag the map in the direction you want to move it. You may also pan by using the arrow keys on the keyboard.
 - d. Click Rotate button to rotate. Click and hold the left mouse button and drag the map in the direction you want to rotate it.
 - e. Click the Compass button to reorient your scene North. You may also press N on your keyboard.

You need to add the following layers to construct the lesson:

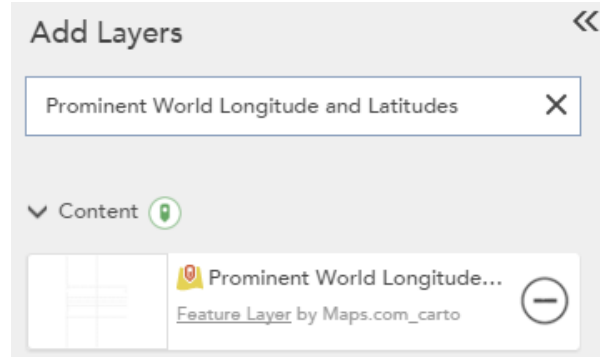
- Prominent World Longitude and Latitude
- World Time Zones
- Cities_tzones

4. Close the Scene Viewer Intro.
5. Click Modify Scene.



5. Click + ADD LAYERS.
6. Change Search Area from My Content to ArcGIS Online.
7. Where it says Search for layer....type **Prominent World Longitude and Latitude** by Maps.com_carto.

8. Click the + button.



9. DONE.

10. Click the pull-down arrow at the end of the layer name.

11. Layer Symbology

12. Change Original Symbols to Change Symbols.

13. Change Size to 10.

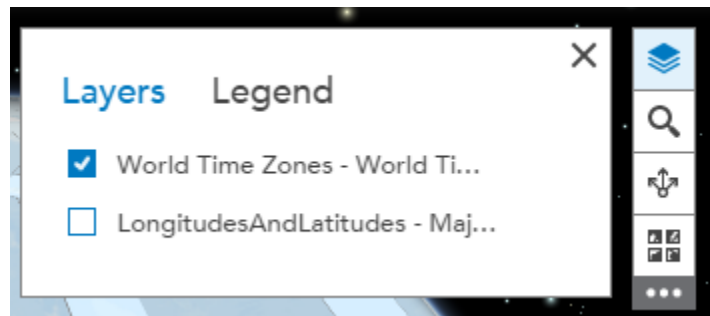
14. DONE.

15. Click + ADD LAYERS.

16. Search for **World Times Zones**. Click + World Time Zone Feature layer by esri.

17. DONE.

You now have two layers on your map. You can turn these layers on and off by clicking the top icon on the top right corner.



Q1 Describe the standard time zones.

Q2 Why do some of the standard time zones have irregular boundaries on land?

Q3 Explain the need for an International Date Line.

Q4 How many time zones are in the continental US?

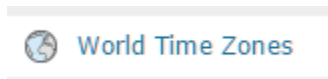
18. Click + ADD LAYERS and search for **city_tzones** and add to your scene.
19. DONE.

Q5 What cities are represented?

20. DONE.
21. Click SAVE SCENE.
22. Add appropriate metadata:
 - a. Scene title: World Time Zones
 - b. Tags: individualized tags
 - c. Summary: Spatial display of World Time Zones



23. Click SAVE SCENE again.
24. Go to My Content to open the World Time Zones Scene.



Q6 Use the constructed Scene to complete the following chart.

Start City	Day/Time	Travel Direction	End City	Day/Time	# Time Zones Crossed
London	Mon 11 AM	West	Denver	Mon 4 AM	
London	Mon 11 AM	East	Denver	Mon 4 PM	
Paris	Wed 1 AM	West	Minneapolis	Tues 6 PM	
Paris	Wed 1 AM	East	Minneapolis	Tues 6 PM	
Rio de Janeiro	Friday 10 PM	West	Tokyo	Sat 10 AM	
Rio de Janeiro	Friday 10 PM	East	Tokyo	Sat 10 AM	

