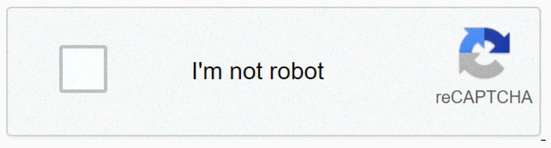

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Topographic map worksheet high school

Introduction: This broad resource contains information about getting USGS maps products, terrain maps, aerial photography, and our full map catalog in support of 27 different lesson plan ideas spanning primary through the teaching content level. Classroom topics range from global coordinate systems (GPS), coordinates, accuracy, exact location compared to relative, historical map projections of mapping, modern cartography, aerial image interpretation, stereo aerial photo analysis, analysis of physical properties on topographic maps, looking at rivers and streams on topographic maps, analyzing changes between impact maps of public land survey systems. (PLSS) in the American landscape, elevated profile, size analysis, map savvy, features, cultural maps, location name validation, 3D modeling, urban change analysis, facet creation (north, east, west). Human maps and hydrology and site versus situation Each concept lesson contains information about the appropriate class, the necessary time and the necessary materials. Purpose: One stop shop for terrain map lesson plan Instructions: 1. Ask each student to determine the latitude and longitude of the school building or campus to the nearest second, using the USGS 1:24,000-scale topographical map, draw a 2.5-minute table in the interior of the map, using a 2.5-minute tic mark on the edge of the map as a guide for editing coordinates. Discuss the process of editing, write answers from all teams on the board. Discuss the need for accuracy. Use a 1:100,000 and 1:250,000 size map of the same area and discuss the difficulty of positioning depending on the map size. Latitude and longitude are in a base of 60 each degree with 60 minutes. Each minute has 60 seconds. Transfer the conversation to a base of 60 with latitude longitude degrees, min, second, 2.Global grade system position: primary, secondary, university required time: 1-3 hours needed: topographic map, GPS, get interpreted latitude and longitude position of your school using the idea #1 of the team outside and save the position with the GPS receiver, stay out at least 10 minutes accurate for the most accurate average. Back in the classroom, compare readings from GPS receivers to readings that each team was cut from the topographic map. Which team is closest to the gps coordinates? How does your GPS unit's coordinates work? UtM coordinates are drawn on the USGS map in a blue tic mark or a 1,000-meter black table, compare the comfort of the units displayed in meters with UTM compared to those shown in degrees, minutes and seconds (with lat/long) discussing the accuracy of your GPS unit: often students will be willing to cancel their own edits from the topographic map and are willing to accept high-tech devices even with accuracy restrictions. Many times, the correction of students is more precise, especially with reading Z (altitude) discussing why so, and the importance of understanding topographic maps and GPS 3.datums grade level: secondary, university time needed: 2 hours to 1 days Messengers needed: 1: 24,000 topographics size map, get what you are The best chance that the initial datum is WGS84 (Geodetic World System 1984) or NAD83 (North American Datum 1983) in the United States, WGS84 and NAD83 are the same. Now see your topographic map. What is the difference between datums North America of 1927 (NAD27) and 1983 (NAD83)? If the topographic map and GPS receiver use different datums, what problems could cause? How do you solve those problems? What is the date of your topographic map? If it was published after 1983, there should be a little cross-dash compensation of about 3 millimeters from each of the four corners of the map. What these resources may be useful: Edge Map (pdf) Datum Shift 4 Benchmarks - Grade survey: Secondary, University required: 2 hours to 1 day Required materials: topographical map, standard (optional) Why are they so important in mapping? Benchmarks and surveys are particularly important for accurate mapping that includes latitude (x), longitude (y) and altitude (z), discussing why people need mapping accuracy, as well as conversations about using maps, and data users who need accuracy. Point out that the needs of the people laying the pipes as opposed to the ones that set the climate zone are very different. If possible, get a standard from a survey company or catalog and show the level what these markers look like, for example, with the help of a topographical map symbol plate asking students to find as many benchmarks on the map as possible. What benchmark features are in? Discuss why some features such as peaks and rail wall are better places for standard installation than others. Permanent talk versus temporary characteristics of these features. Possible consequences of standard installation in sand or in trees Discuss tri-leveling techniques and levels. If possible, go on a field trip and try to find one or more of the standards that students have found on the topographic map. Be aware of security considerations when searching for standards. Many are in busy intersections or along the tracks. See photos of USGS impersonators working with benchmarks and three-point system stations. 5. Geo-convergence grade system: secondary, university required: 1 hour Material needed: topographical map, earth shows how the lines of the longitude converge from the equator to the pillars of the first concept show in the world Next, show a topographic map from the northern United States (North Dakota, for example) vs. maps from the south of the country (Texas or Hawaii, for example), why the map in North Dakota is narrower in the northeast direction than those in Texas and Hawaii? What is the difference between the 7.5-minute longitude line, calculate how far between the minutes of each longitude and calculate how far between each degree of longitude. Measured on several different maps, the distance between latitude lines. Asked students why latitudes didn't converge, and showed the world 6.Compare grade system coordinates: secondary, university time required: 1-3 hours, materials needed: terrain map, USCM fact sheet, map showing the coordinates of the aircraft, the state discusses the places measured on a piece of graph paper in the geometry with the coordinates system. Discuss why places on Earth need to be located and measured according to the coordinate system as well. Three commonly used coordinate systems are latitude/ longitude (geographic coordinates), Universal Cross-Mercator (UTM) system and state plane coordinate system These three coordinate systems show usgs topographical maps (map margins), asking students to determine the origin for each available coordinate system. Pair the USGS map with a state highway map or a map of other states according to the county map or parcel map in the state plane coordinates. Ask why using map forecasts Inquire about the relationship between map forecasting and coordination. Discuss why different coordinate systems are used for different purposes. Discuss which data users need one system over another, and talk about the needs of local governments versus global needs. When does the coordinate system have more advantages than other systems? These resources may be useful:map, compare, projection, and use of the 7 coordinate system, the accuracy of the grade coordinates: secondary, the time required: 1-2 hours needed: the terrain map discusses the accuracy of reading, latitude, and longitude, leaving the USGS topographic map as a comparison begins with asking why. It must be divided into minutes and seconds to increase accuracy. If two people meet after school at 4:00, and if one of them appears at 3:58, while the other arrives at 4:02, the time difference will not matter. We understand that we don't mean exactly at 4:00 but close to 4:00 pm however, if you're launching a spacecraft, it's important that you indicate that the launch will be precise at 4:00.0355. Similarly to places on Earth, sometimes the approximate place is done as in front of the library. However, if you install high-speed internet in front of the library, you will need to know precisely where to dig and install cables. The maximum distance of 60 miles may separate latitude or longitude. For increased accuracy, you need to read down to a tenth of the second of latitude and longitude of the location. This is why people have divided latitude and longitude degrees into minutes and minutes in seconds. 8. Absolute with relative location class: secondary time required: 1 hour material needed: topographic map discusses the difference between absolute location and relative location of the difference between 42 degrees, 7 minutes and 31 seconds, north latitude, 101 degrees, 15 minutes, and 44 seconds, western longitude, and phrase. Northeast of Pleasant Grove? When is absolute position important, and when is the relative position important? 9. Grade-level estimate map: Secondary, University required: 1-3 hours Essential materials: topographical map, world, USGS poster projection map (order free printed posters from USGS Store, $5 handling fee per order total) Ask students to check the map projection of the USGS map, select the topographic map compared to the other maps, indicating that each map is drawn according to the projection of a specific map. Discuss the benefits and disadvantages of different map estimates. Why does Greenland and Canada look so large in Mercator projections? You can use low-tech tools for illustrations, such as peeling orange and trying to flatten out the shell on a flat surface. You can take advantage of high-tech tools such as GIS information systems (GIS) as follows: draw a circle on a map of the world and then change the projection view, noting that it is distorted with different estimates. Determine how and why the distance from Honolulu to Los Angeles varies and how the angle with the equator varies. Discuss the world drawing process on two-dimensional paper, causing distortion in distance, direction, space and angle. Use the USGS poster to estimate the map as well. text to indicate that the distance, direction, angle or area must be distorted. When is the best time to distort distance/direction/angle or angle? If you have to choose 3 of 4 attributes to correct what they are, what would it be? Show how to choose a projection map based on the application. Shows how projection of a map is more noticeable in a small size than on a larger map. 10. History of Grade Kart Tha: Secondary, University Required Time: 1-4 Hour required materials: topographic maps, other maps, USGS Map Survey Packet Teachers check maps made past and present. Get negative information and written materials from companies that film or sketch, get writing tools; Pencil in some lines in the movie and there are students trying to follow them with writing tools. Alternatively, using pencils and tracking paper placed on top of the USGS's topographic map discusses the fact that most topographic maps are prepared using writing and tracking tools. Discuss Why film is used over paper: the film does not shrink or swell as much as the paper with changes in temperature and humidity, thus maintaining national standards of accurate maps. This packet contains two posters showing historical maps back to Babylon through the Middle Ages to the current map. Modern Cartography Grade Level: Secondary, University Required Time: 1-3 hours needed: topographical map, GIS software (optional) discuss geographic information system (GIS) and the ability to draw all points, lines, and areas on the computer. Ask students to explain the advantages of mapping on a computer with a hand. Advantages include the ability to change projection-sized symbols, and then there will be a map layer for analysis in GIS, visiting websites that use internet-mapped server software, where students can create maps with web browsers. National Viewer map is a great option. 12. Aerial photo grade interpretation level: secondary, university time needed: 1-4 hours needed material: topographic map, USGS or other aerial photos get aerial photos of space from USGS (etc.). Select an area on the map and click Add and Download at the bottom of the free digital download page) and also a USGS topographic map (using the USGS Store and click on Location Map) covering the same area. Ask students if they can identify stadiums, lakes, golf courses, schools, office buildings, hospitals, churches, streams, mountains, and other features on aerial photos. The world is more complex than at first realized. Schools may be tracking sports, but what about schools in dense urban areas? Do they always have a track? Some schools Looks pull-out drive for drop-offs, but does your school have one? Ask students to specify the time of year for the photo taken, what are the clues? Do the leaves on the tree have any suggestions? Ask students to specify a shooting time, what are the clues? Having a car or not having a vehicle in the school parking lot tells you about the day of the week and the time of day? What is the best time to take pictures if you are mapping from photos? Near noon solar energy is best to reduce shadows. Near the summer solstice is best yet to reduce shadows, except in heavy wood areas, when the leaves close times are best in March and November. Magic Eyes Will students see them in three dimensions? Get a stereo viewer and get a stereo air pair. There are also many stereo pairs on the web. If the student has a problem, shoot the table in the correct overlapping position. 14. Creating a map from grade-level aerial photos: Secondary time needed: 1-3 hours necessary: topographical map, maps of other types of mind, aerial photos, usgs aerial photos of your school or other locations (use GloVis and select the option. Aerial Collection Select an area on the map and click Add and Download at the bottom of the page for free digital downloads.) Place the tracing paper on the photo and place the tape down. On the track paper, decide which features you will then categorize the map. Decide the colors and symbols you will use to draw each feature category. How should each feature be mapped where the map is not too complicated or cluttered? Use the USGS topographical symbol as a guide. Map with all elements of TODALSIGS--title, author, date, author, legend, scale, index, table, source. Students will decide which features should be mapped. Discuss why the real world needs to be made easy to make maps. For a theme drawn on a map, there's a theme that's omitted (for example, soil),. Go out and step out of features like one side of the school building and compare it to the distance on your map. Analyze physical properties on topographic grade maps: secondary university preferred time: extend from 1 hour to several weeks, necessary materials: topographical maps, where a variety of scales visit. The site maps terrain maps that show geographical features such as eskers, drumlins, glaciers, playas, Canyons, mesas, glaciers, and other geographies. Dunes, marshes, floods, volcanoes, alluvial fans, lava beds, karst, etc. How can these features be identified on a topographic map? What is the size of each of these features? What is the optimal size for checking all physical attributes? What is the national or regional form of these physical properties? How does physical characteristics affect the number of settlements of the population and patterns? 16. Look at Streams and Rivers in terrain grade map: Secondary, University Required Time: 1-3 Hours needed: One or more topography maps show long streams and/or rivers looking at streams or rivers on the topographic map, especially one that crosses the length or width of the map. In which direction does it flow? How do you know that? Estimate the altitude of the river that enters the map and that leaves the map. What is the estimated distance the river flows on the map? The gradient is displayed as a vertical distance divided by the horizontal distance. It may also be displayed as a percentage. What is the gradient of the river on the map? Do you expect the river to chase water levels to be much closer to its source or near its mouth? Find real-time emissions for big streams and rivers on the USGS water surface site, where rivers as wide as Mississippi on the terrain map determine arbitrary depths. What is the area across the river at a certain point (width x deep). Set arbitrary speed, such as 5 feet per second. (speed x width x depth), which is the most important factor in determining how much material is eroded and transported by the river. - Gradient or release? This resource may be useful: streams from national map 17, analysis of changes in the grade terrain map: Elementary, Secondary, University Required: Expand from 1 hour to 1 weekMaterials needed: Historical topographic map and US Topo map, you can download a whole historical set of topographic maps for most places in the United States via maps and download them in the USGS Store freely. Download us map Topo at the same site Ask students how often maps of the moon and Mars are updated. Answer: Infrequently! Maps of the world, by contrast, are often woeful from the days when they were published. Earth is a dynamic planet - not only do we have volcanoes, landslides, earthquakes, floods, erosion and other organized landscapes, we have more than 6 billion people building buildings, canals, reservoirs, transportation systems and more that affect the earth's surface. Get a map of the historical terrain and compare it to the current (US Topo) version for the same area. Try to get them for your place. View oldest map Which place name is used horizontally and what is it? Which name is not used today and a new name exists? Why is your community located? Where does your community start in that direction(s) it expands and why? How will it grow in the future and how? What will your community look like on the map, doing ten years from now? Fifty years from now? What is the use of historical land in a given region and how has it changed over the decades? What influences do physical properties such as rivers and mountains have influenced the development of communities and regions? What influence did the first roads and freeways have on urban development? Why are some areas of the city developed as an industry? How has the city changed over time? How do forces such as tourism, mining and agriculture shape land use as it is depicted on the map? Discuss physical changes with human-induced changes. Examples of maps with physical changes include the Lake Montana Earthquake, South Passage Louisiana and Mt St Helens, Washington. Examples of maps with human-induced changes include any map with reservoirs or urban areas. See mystery map lessons for more ideas. This resource may be useful: USGS Geographic Name Information System (click on Search local names). Impact Analysis of Public Land Exploration System (PLSS) in American Landscape Grade: Secondary, University Time Needed: 1-3 Hours needed: Topographic map of PLSS and non-PLS state; Discuss the 1785 Ordnance Act, signed into law by President Jefferson, that provides for this exploration as a system and monument of public domain land. Get a public land survey map (buy a paper map or download a PDF) from usgs that shows the spread of community and range systems for dividing up land for settlement, starting in Ohio and moving west. Roads in these states are often laid out running due to the north, south, east and west. States that settled before this Act signed show metes and road network boundaries where roads operate in a variety of directions, but rarely because of north, south, east or west. Meridian core and base line maps are great supplements. Discuss Why Texas has no PLSS (it is a separate country for a period of time) What is the impact of this system on the rural landscape? Comparing the landscapes created in Virginia - roads and boundaries - compared to the rectangular landscapes in Kansas, what is the impact of this system on urban landscapes? Note, for example, the normal schedule in phoenix street model compared to the unusual form of the road in Atlanta emphasizes that the action from 1785 still affects the route we take to get to school every day! Do you travel on a section of the road to reach your school today? Compare & Compare PLSS system with a very long system of low Mississippi river basins. Why and how many systems long developed? Grade profile ing: secondary, university required time: 2-4 The material hours are required: topographical maps, multi-line drawn rulers, called transects, in the USGS topographical map. Where is the highest terrain? Flattel? Why are the most active forces horizontally in this area? Water, flooding, erosion? Coastal storms? Which forces have been the most active in the past, Glacier? Has the former been the same force as the current forces? The students plan the railway and road from point A to point B through the mountainous area, giving students an 8% limit for the top grade and 2% for the highest rail grade. Show the map with trains in another area and allow students to compare the number of twists and turns and calculate the total distance between the road and the railway. Why do roads and railways have different criteria for construction? Scale Grade Analysis: Primary, Secondary and University Required: 1-5 Hours needed: A terrain map at different scales (free download via USGS Store Map Locator and Downloader) is the relationship between the distance on the map and the distance on the ground, and usually a fraction or ratio - 1/10,000 or 1:10,000, for example - meaning that the one unit on the map represents 10,000 units on the ground. Check the differences in maps with different scales. Get a map of different USGS in the same area. Your city is as large as 1:24,000 compared to 1:100,000 sizes compared to 1:250,000 sizes compared to the state base map of 1:500,000 sizes? What accounts for this difference? What is the most suitable scale for the map, not depending on what it is used for and who will use it? What does the 1:1 level map of your classroom look like? In turn, let students draw a map at a specific level that you define. Ask students if anyone has flown on board. Discuss how the size of the visible area has changed as the plane climbs to a high altitude. This concept explores more in the USGS map adventure for K-3 teachers discussing the rather confusing concept of a small map compared to larger maps. A larger map (for example, 1:24,000) is a larger number, or a fraction greater than a small map (such as 1:100,000) and displays larger details. A small map shows a larger area but a smaller detail. Compare this with more common applications. 1/10 Pizza is larger or smaller than a pizza 1/100 or not 1/10 is larger and corresponds to a larger map. The world may represent the best small maps. Discuss your journey from city to another city with thousands of kilometers. Let's start with using the world. When will you need a larger map compared to small? You may need a small map to travel from your city to other cities, but when you go to other cities, you need a larger map to get to your final destination block within that city. It can also be displayed using a site with maps with graduated zoom functions such as Google Maps or Yahoo Maps 21. Analyze cultural features in topography grade maps: Primary Secondary UniversityTime required: extended from 1 hour to several weeks The necessary materials: 1:24,000-size terrain maps from a variety of areas in both urban and rural areas, there is significant commercial activity of the area shown on the selected top map? How do these activities are reflected in the culture or man-made features on the map? Do people want to move to this area? Why is this fast or slow growing or decreasing area and why? Which forces act to limit or promote growth? Are local, regional, national or international forces on a scale? Why do some areas use concentrations in certain areas? For example, what kind of building is near the railway tracks? Near the stadium? Near interstate highway? 22. Analyze the location name in the topography grade map: primary, secondary, university time needed: extended from 1 hour to several weeksMaterials needed: 1:24,000-size topographical map from a variety of areas, both urban and rural, how nature and cultural properties get their name? Which organizations in each country accept the right name? Check out the website for the U.S. Commission on geographic names for their procedures and history. Can I change the name? How, the location name in the USGS topographic map of your choice, what origin and nationality? Compare names to names on other topographic maps. How old is the name on your map? Find your name on the USGS geo name information system, a database with more than 2 million names on the USGS topographic map. 23. Create 3D grade-level models: primary, secondary, university required: 1-3 hours Necessary material: terrain map, plaster of Paris or other modeling materials, water, tray or topographic map and 7-8 clear plastic salad container, paddle, or similar item create a plaster pattern of space on terrain. Take the water, see the line from the top to illustrate the concept of the line. Use a clear salad tray from the food store. Track one line in each tray. When finished, you will have a 3D model through your landscape. See our complete guide for how to create a Topo style salad tray. 24. Urbanization analysis during elementary school, university required: 1-5 hours Necessary materials: topographic map of urban areas at 1:24,000 and 1:100,000 sizes using USGS topographic map of urban area urban monitoring area. Older review versus newer urbanization How do you know that older versions What are the differences in street layout and why? Discuss how the selected city started and why it started and why it spread. In that direction(s) it grows and why? Are rivers or other physical attributes helping areas of the city get started? Why is the old town often along straight roads and smaller houses compared to newer urbanization? Discuss popular culture and consumer needs How much of this city occurs in the city of your choice? Is it more or less than any other city of equivalent size? Why are local, regional, national and international armies acting in any city to make changes? Create Aspect Maps Grade: Secondary, UniversityTime Required: 1-3 hours Required material: topographic map, blank poster paper sheet on the side means direction (north, east, south, west) at the slope. Create a side map by examining the contour lines on the topography map of the USGS, discussing who will be interested in the front slope direction. What influences soil, moisture, plants and wildlife habitats? Ski areas are usually built on? Discuss microclimates of slopes. Where is the ski area in the southern hemisphere? Discuss the relationship of the sun world 26. Human analysis and hydropower elevation level: secondary, university time needed: 1-3 hours necessary: terrain map, GPS reception, metal dividers for correction (optional), discuss floodplains, rivers, and river settlements both promote (trade and traffic) and discourage (with flooding). Why do big banks help the growth of big cities while other banks are sparsely populated? This can happen if one bank is higher and is free of flooding, and the other is historically flooding the trend. One example is Omaha, Nebraska, on the high west side of the Missouri River compared to the Iowa Bluffs Council in the Eastern Bank, a flood of trends. Omaha grew faster than Bluffs Council and remained the main city in the region to this day. What is the leverage of the two banks of your choice? Discuss the importance of city sites to be on flood-free sites higher. Site vs. Class Situation: Secondary, University Preferred Time: 1-3 hours Required Material: Topographic Map New Orleans West and other sites refer to the physical features of places such as soil, drainage, climate and so on. The situation refers to the advantages and disadvantages of one place in another place, considering trade routes, transportation and other regional and international connections. Discuss the site situation with the situation with the USGS terrain map at different levels. Check out New Orleans West, Louisiana, 1:24,000 size maps, roughly the amount of land below sea level. Hurricane Katrina, i'm sorry. In 2005, discussed the sustainability of land drainage for city sites in the River Delta. Discuss the site situation with here and elsewhere, New Orleans is a bad site (prone to flooding), but there is a good situation (near the mouth of a large river). Discuss the impact of global sea level rise in New Orleans Discuss another place that is a good site but a bad situation (for example, a well-drained place in the middle of the plain, far from the path or river)).