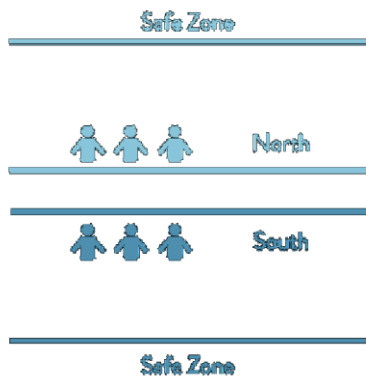


Lesson #1.

Introduction: Cardinal directions and compass.

Game: Cardinal Direction Tag



Purpose: Get familiar with and practice using cardinal directions

Equipment: Cones (optional)

- Instruct participants to stand to face a partner about 2 metres apart. The group will be standing in 2 long lines facing each other. Identify 1 line of participants to be team North and the other to be team South.
 - Have each group determine a “safe zone” that is behind each team’s line. Instruct the teams to set up in their assigned directions (see diagram below). Ensure safe zones are equal distance away from the center line. Mark the zones with cones, water bottles, or natural objects in the area.
 - Call out a name that is “North!” or “South!”. The team whose name is called tries to tag their partner, who turns around and tries to reach the safe zone before being tagged.
 - Instruct the group to quickly return to the starting lines and listen for the next name to be called.
- Some variations are to create more teams, have tagged players join the opposing team, or start in a balance or strength pose (such as an airplane or tree pose or in a plank or push-up position). Then rearrange to West- East lines.

Discussion topic:

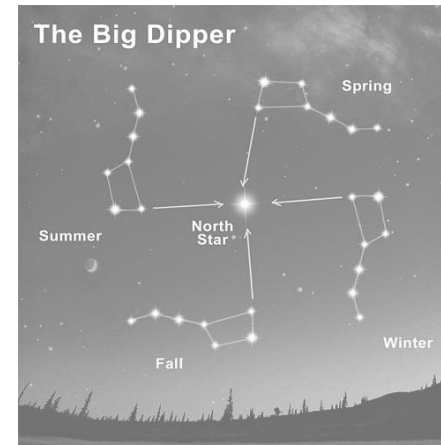
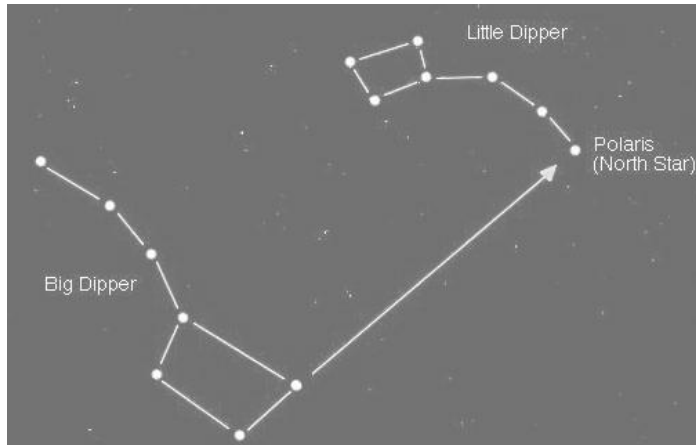
If you didn’t have a compass, how else could you determine North, South, East and West?

- Look at where the sun is in the sky and the time of day (if known). The sun will rise in the East in the morning and set in the West in the evening.
- Determining East-West line with a stick when sunny:

Take a stick and place it upright so you can see its shadow; the taller the stick, the better. Make sure the shadow is on clear, level ground. Mark the ground at the edge of the shadow with something small like a pebble. Wait 10 or 15 minutes then mark the edge of the shadow again. Make a straight line between the two marks; this is a rough East-West line.

- No Sun: In the forest, the thickest moss will generally grow on the North side of the trunk of a tree. Therefore, if you can find the mossy side of a tree, you know which direction you are facing! Look at the whole forest rather than a single tree which side appears to be more mossy? (The North side of a tree will get the most shade and moisture. Ideal conditions for moss!)

- At Night: Find North at night by the North Star to know the direction of “true north”. Locate the Big Dipper. Locate the two stars at the front edge of the cup. An imaginary line between these two stars, extended out about five times from the Big Dipper’s cup will point towards the North Star (Polaris). It also happens to be the last star located at the end of the Little Dipper’s handle (though the ‘Little Dipper’ itself is dim and often difficult to see).
- The reason is because the axis of Earth is pointed almost directly at Polaris. Throughout the night, if you observed Polaris at different times, you’ll see that it remains in the same spot (year-round). All of the other stars will actually appear to be circling around it over time...



Navigation activity

Exploring & Navigating

Purpose: Explore the outdoor area, while practicing using maps and the cardinal directions.

Equipment Needed: Controls, Compass, printed map of the area with cardinal directions on the edges (a screenshot of a Google map works well).

1. Introduce participants to a compass. It is ideal if they can have one per pair, however, one for demonstration will suffice. Ask participants, “what is a compass for?” “How does it work?” The red compass needle will always point North. It will always point toward the earth’s magnetic North.

2. A short video about basics:

https://www.youtube.com/watch?time_continue=111&v=5w4qKnfJww0

3. Identify cardinal directions with major features to teach which way the cardinal directions (N,E,S,W).

4. Hand out the maps of the area and orient it with the compass facing North. (The map North should be aligned with the compass North. Now everything on the map should be aligned with reality).

5. Look at features and identify them on the map. Talk about “Bird’s Eye View” of the space. Have participants turn to face different directions, but practice keeping the map to the North.

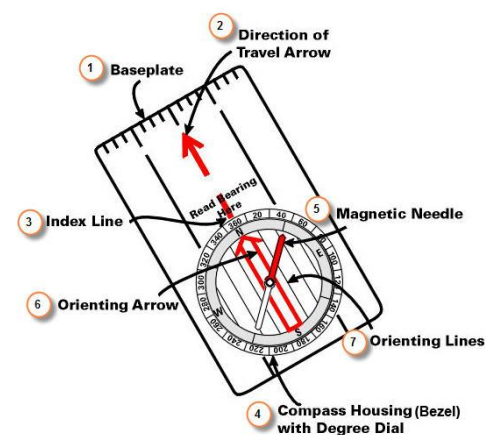
6. Ask participants to identify on the map where they are: red triangle

7. Group the kids 4 groups (There are 4 different maps North, South, East, West group. They each have three controls at each site).

8. After grouping the kids, they need to go and visit the controls and read the words on the controls to put a phrase together.

9. After finishing one direction, they switch maps and visit the next direction until they visited each cardinal direction.

10. Talk about the phrase they collected (Never Eat Soggy Waffles- helps to remember - NESW).











Lesson #2.

Orienteering on a course

Game: Cardinal Direction seek & find

Purpose: Review directional skills and learn judging distances

Equipment Needed: Objects to hide, compasses (optional).

- Mark out one meter on the ground and allow each participant to find out how many of their regular steps are in one meter. It is usually about two steps for children. (Identify 10m and 50 meter)
- Group participants into small groups or partners.
- Give each participant an object (beanbag, cone, etc.) and ask them to go hide them.
- One partner at a time will give directions to find the object., participants may only use the compass and cardinal directions to direct others, i.e., move 50 metres to the North, then 25 metres to the East.
- Return to the starting point after finding each object and take turns until all objects have been found!

Discussion topics

What are landmarks and catching feature?

It's important when you're exploring outdoors to pay attention to **landmarks** which can be **land features and man-made features** that stand out from the environment. These features help you to locate yourself on the map and if needed remember how to get back where you started from.

If you are starting to lose your way, try backtracking where you came from. Identify landmarks along the way that will help you return to your starting point.

Landmark: A significant, easily observable, landscape feature. (hill, big tree, river etc) it helps to determine one's position on the landscape.

A catching feature is an object or landmark that is just beyond the control you're looking for. It's important to determine your catching feature to know if you've gone too far. For example, you might notice a cluster of trees on the map, just beyond the control you're looking for. Keep this in mind as you search, turning back if you go too far.

What do you do if you can't find the next control?

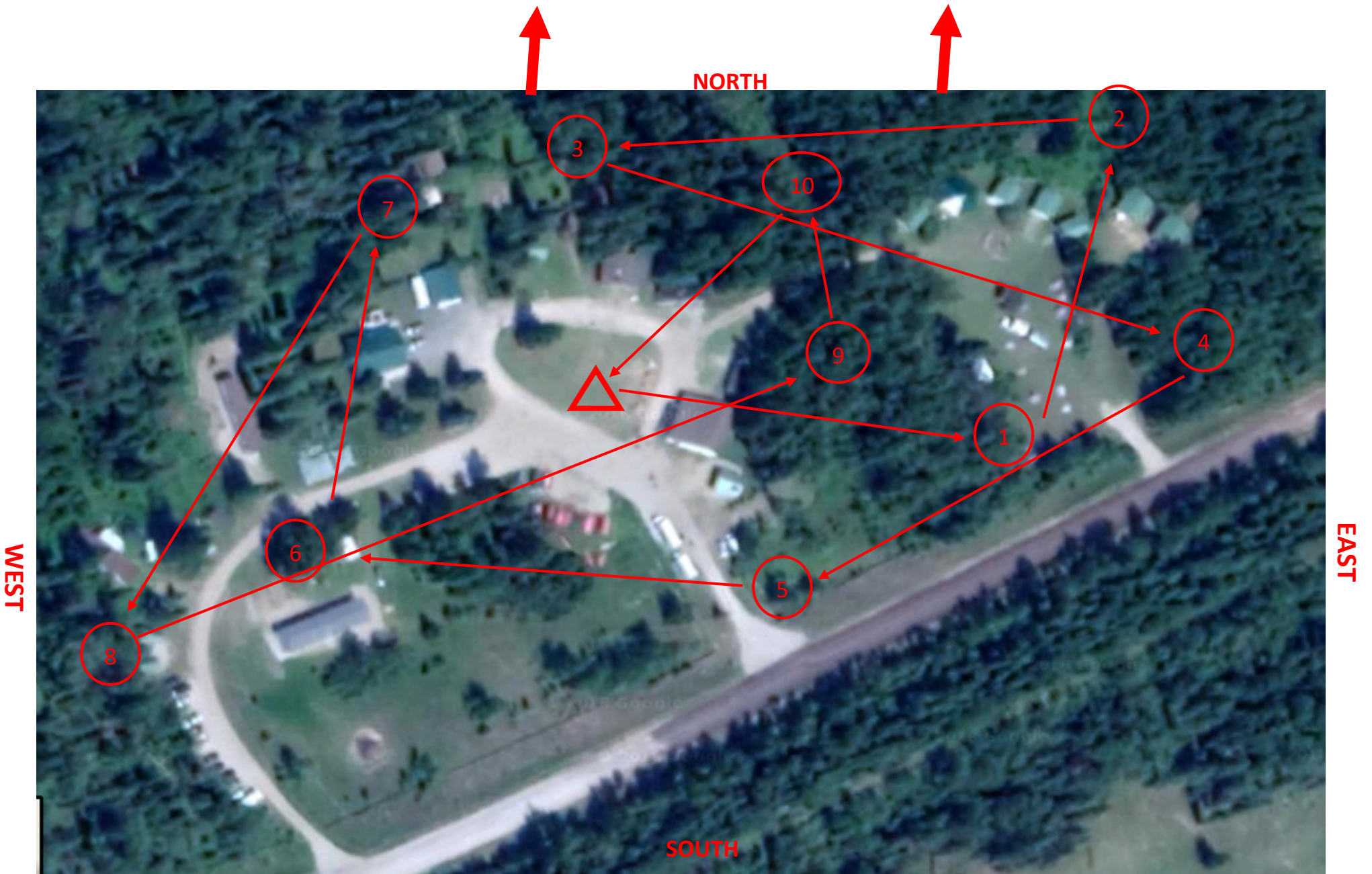
Relocation: In case you don't find the control you're looking for, return to the last control you were at or to a major land feature where you are sure to be identified about your location. Once there, orient the map with the cardinal directions and find yourself on the map then look for the next feature and try again!

Orienteering course:

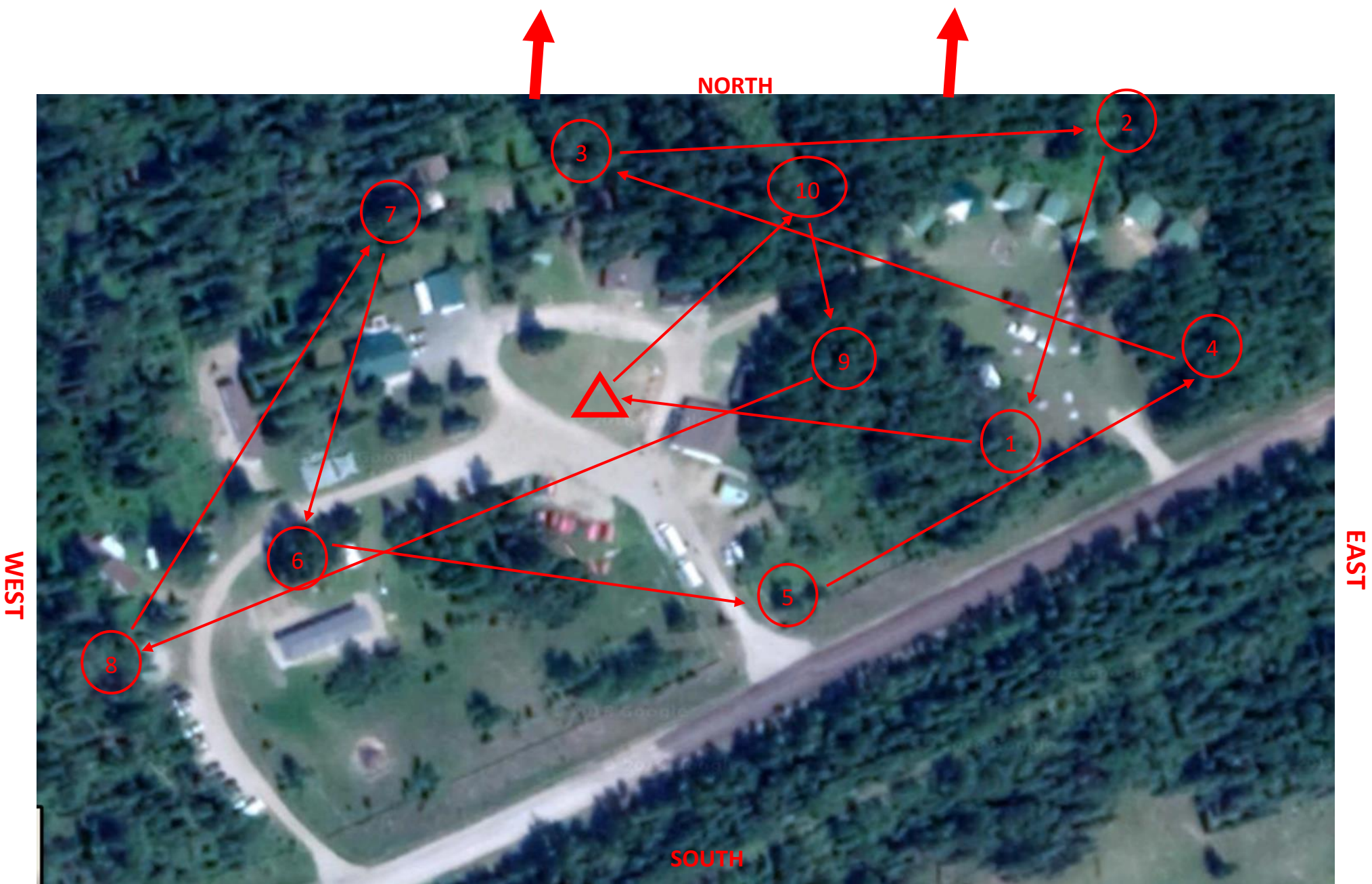
Purpose: Participants will practice navigating on their own to each of the controls in numerical order.

Equipment Needed: One compass (or compasses for each group if available), Google map printout with controls marked, controls with stamp or control punch.

- Go over the cardinal directions with participants on a map.
- Align the North arrow on the map to North on the compass. Identify a big feature (building, hill, fence etc.) which will always be North. Instruct participants to always point the map N in that direction.
- Explain to participants that they are going to start at the triangle, and must visit the controls in order. Once the participants have gone to the control and have "punched in" they can then go to the next control.
- Find each control in order as numbered. Split into partners. If possible, create two or more different number courses so participants don't follow each other.
- Before sending participants out, remind them about the importance of safety. Never leave your partner behind and come back to the start if they can't find the controls.
- If there is enough time, groups can change the order and try it in the other direction.



1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----



10	9	8	7	6	5	4	3	2	1
----	---	---	---	---	---	---	---	---	---

Lesson #3.

Taking a bearing and introducing contour lines

Game: Capture the Flag

Split into two groups and two areas. Give three flags to each team they need to hide it and mark it on the map.

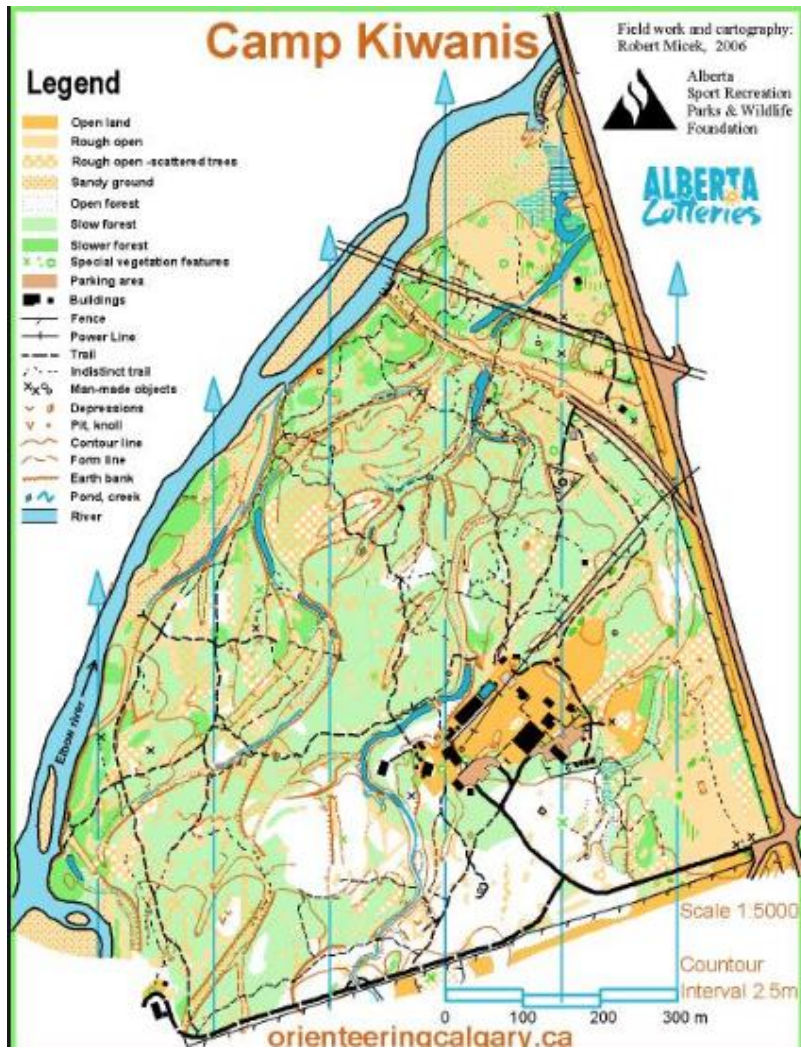
The goal is to grab the enemy team's hidden flag and bring it back to your side -- but if you get tagged in enemy territory, you have to go back to your side to restart. If you get tagged while carrying a flag you have to drop it right where you were tagged and return to your side to reset. The first team to steal the other's flag wins. No one can guard a flag closer than 5 m.

Taking a bearing:

Great short video: https://www.youtube.com/watch?time_continue=91&v=rZd0RfsC-9I

How to take a compass bearing

- To start with you need to know where you are on the map (point A) and where you want to go to (point B).
- Line up point A and B with either the side of your compass, making sure that the direction of travel arrow is point in the direction you want to go in (so towards point B).
- Now you want to turn the compass housing bezel so that the "N" on the bezel and the orienteering arrow are point to grid north (the top of the map). To help do this – make sure that the orienteering lines are lined up with the north lines on the map.
- Look at the index line – this has given you your bearing from the map. We now need to add the **XY**[°] (14.63) to this to make grid north match magnetic north. **Magnetic declination in Rocky Mountain House, is +14.63°**
- Stand up with the direction of travel arrow pointing directly in front of you. Walk around in a circle until you have the compass needle lined up with the orienting arrow.
- Look up, following the direction of travel arrow and pick a natural feature or landmark that is directly in line with where you are looking / where the direction of travel arrow points to.
- Walk towards this landmark and once there check your bearing, pick another landmark to walk towards. Repeat this until you reach your destination (point B).



Discussion topic

Magnetic declination in Rocky Mountain House, Canada is **+14.63°**

What is Magnetic Declination?

A compass North Needle lines up with the magnetic field in a direction called magnetic north. True north, on the other hand is the direction from a given location to the north geographic pole. The angle between magnetic north and true north is called magnetic declination. This angle varies depending on position on the Earth's surface, and changes over time.

Orienteering map versus Topo map (hiking maps)

Orienteering maps are printed aligned with the magnetic North and this requires an adjustment to be made to the base map. When taking a bearing on orienteering map no need to add any declination since the whole map is already rotated when the map was created so the gridlines on the map align with the magnetic north.

On Topo (Hiking) maps you need to look for the magnetic declination degree and add that to your bearing. If you have a very old map it can be off since it changes over time.

More about Orienteering maps

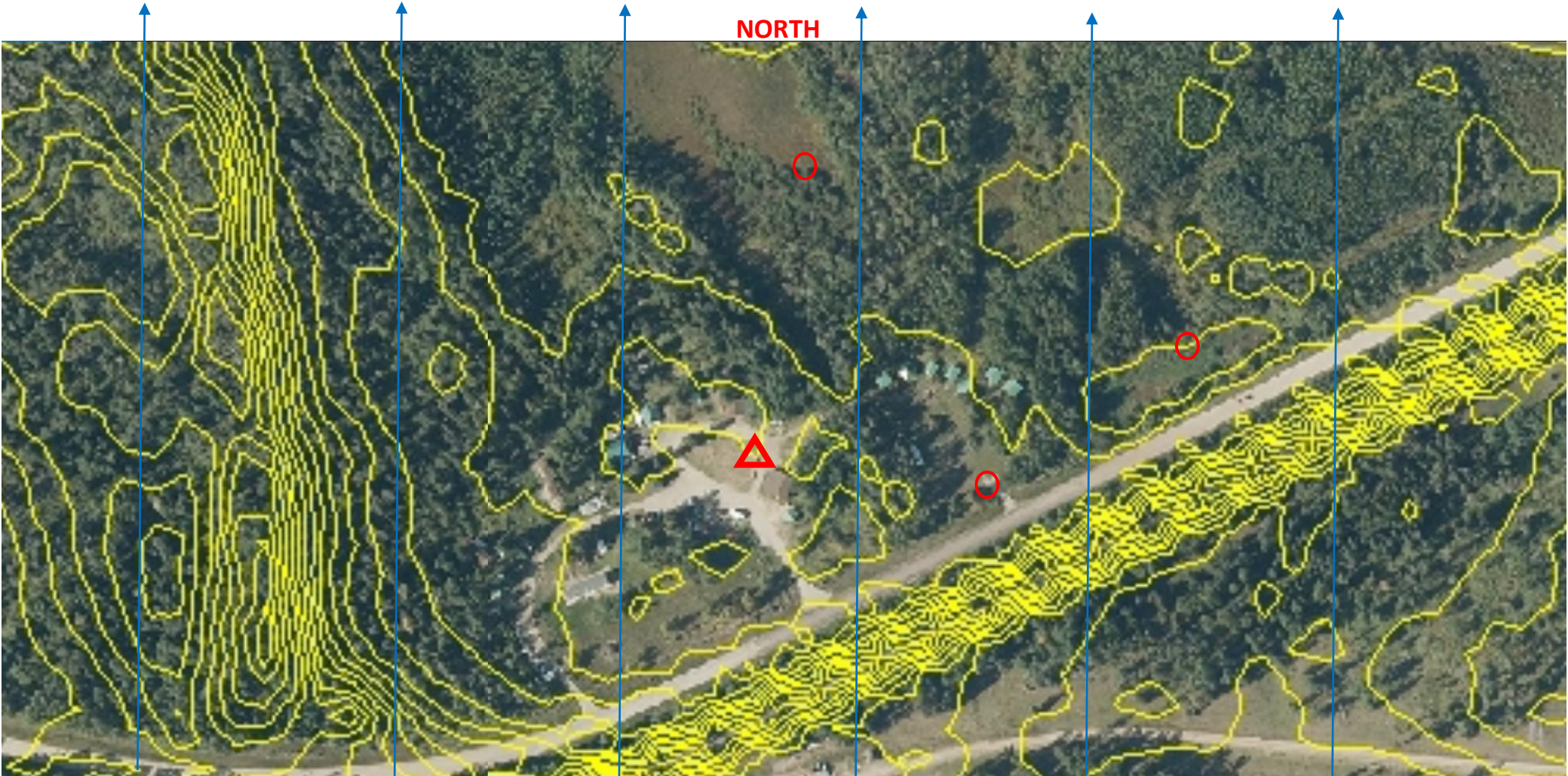
An orienteering map is a map specially prepared for use in orienteering competitions. It is a topographic map with extra details to help the competitor navigate through the competition area.

These maps are much more detailed than general-purpose topographic maps, and incorporate a standard symbology that is designed to be useful

to anyone, regardless of native language. In addition to indicating the topography of the terrain with contour lines, orienteering maps also show forest density, water features, clearings, trails and roads, earthen banks and rock walls, ditches, wells and pits, fences and power lines, buildings, boulders, and other features of the terrain. Orienteering maps are 1:5000, 1:75000, 1:15 000 or 1:10 000 scale.

More info brochure: http://www.orienteering.ca/wordpress/wp-content/uploads/AllAboutOrienteering_OrienteeringCanada.pdf

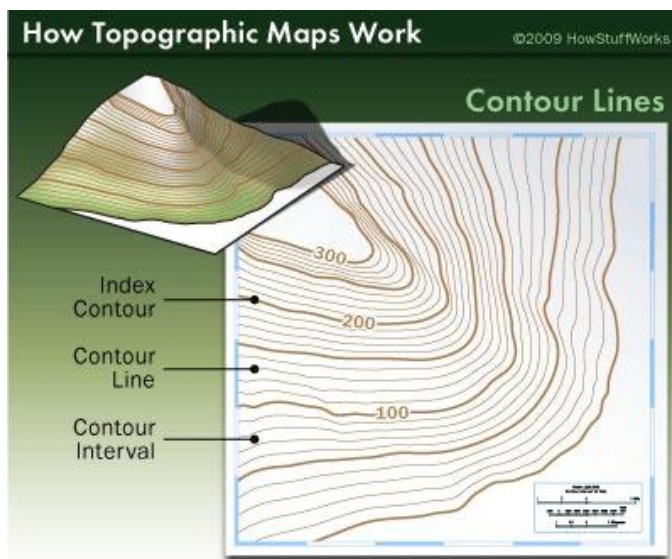
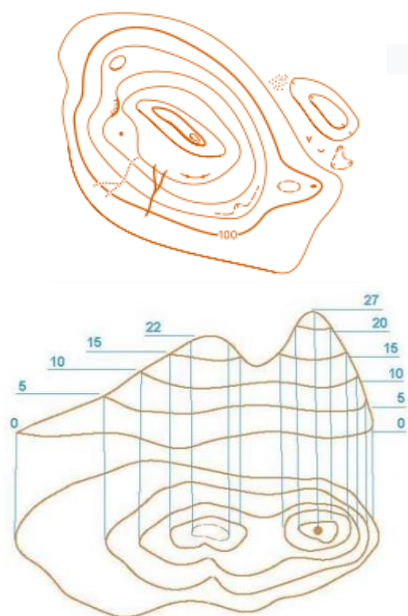
NORTH



Taking a bearing: Orient yourself to the North.

1. Align the side of your compass with the triangle and one red circle you choose to find.
2. Turn the bezel to align the compass orientation lines with the blue north lines on your map
3. Add magnetic declination +14 .6 degree (Turn the bezel by 14.5 lines to the left)
4. Keep your north needle in the "red arrow= Orienteering arrow" and your compass side = (Black travel direction arrow) will show the travel of direction.

Introducing Contour lines



Landform	Contour pattern	Description	Picture
Steep slope		Contour lines close together	
Gentle slope		Contour lines far apart	
Hill		Rounded area projected above surrounding land	
Valley		V shaped in Australia, caused by water erosion	

Contour lines describe the Landforms on a map:

“Scientific: Contour lines are lines on a map joining points of equal heights above or below sea level on a topographic map. These maps are just a two-dimensional model of 3D landforms on Earth. The characteristic of topographic maps are the contour lines that allow interpretation of 3D shapes on the Earth's surface.

The contour interval is normally 5 metres, but can vary by different scale of the map. Top0 maps can be 10m or even 50m.



HeLa Ventures Area - Lidar Map



Find it on the map:

1. Hill top
2. Earth bank=riverbank
3. Gentle slope
4. Steep slope
5. Valley
6. Saddle, spur, reentrant

Lesson #4

Game: Setting out controls/ flags

- Partner up the kids. Each gets a map and a ribbon for Flags.(they can write their name or Team name on it.)
- Everyone heads out to hang the flag ribbons then to mark it on the map. After partners switch the maps and they need to bring back the ribbons.

Variations: add a time limit 10 min for everyone to hang two ribbons.

Everyone need to mark it on the map so now you have lots of flags marked. Start everyone at the same time and see who can collect the most ribbons. (Cant collect the ones you have put out. The first person who touches the ribbon can collect it).

When you are setting out controls you need to move slowly making sure that you exactly know the place you are. Try to find an identifiable area or feature where you can hang your control and mark it on the map.

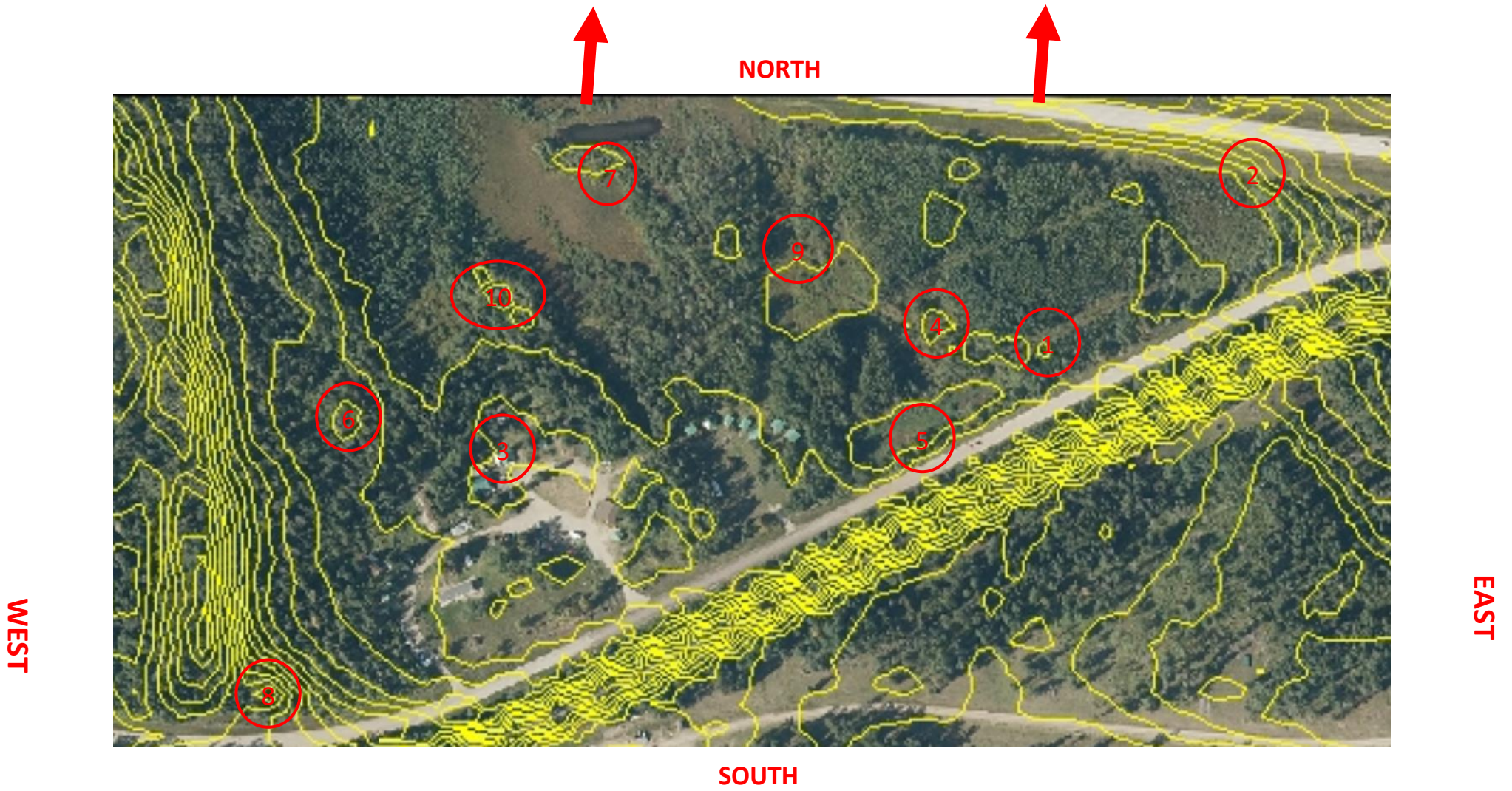
Score O

- Find all the controls within 30 min max time in any oreder.
- After time is up each minute cost 10 points off your total score.
- Figure out the riddles for extra points.

Example riddles to spread through controls:

1. What number is twice the sum of it's digits? - **18**.
Add 18 to the final score
2. I'm always hungry and must be fed, the finger I touch will soon turn red, what am I? _ **FIRE**
3. What gets bigger the more you take away from it? - **Hole**

Dig a small hole by the fire pit and hide labels for 30, 20, 10 Points which can be added to the final score.



SCORE -O :

1	2	3	4	5	6	7	8	9	10
10 pt	20 pt	10 pt	10 pt	10 pt	20 pt	20 pt	20 pt	20 pt	20 pt