

*Presented at:*

Atlantic Canada Association of Science Educators (ACASE)  
Annual Conference, 7-9 July 2005, St. FX University, Antigonish, NS

# Integrative Science:

## "Natural Horizons" in Science Education

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Integrative Science Program

Cape Breton University, Sydney, NS



CAPE BRETON  
UNIVERSITY

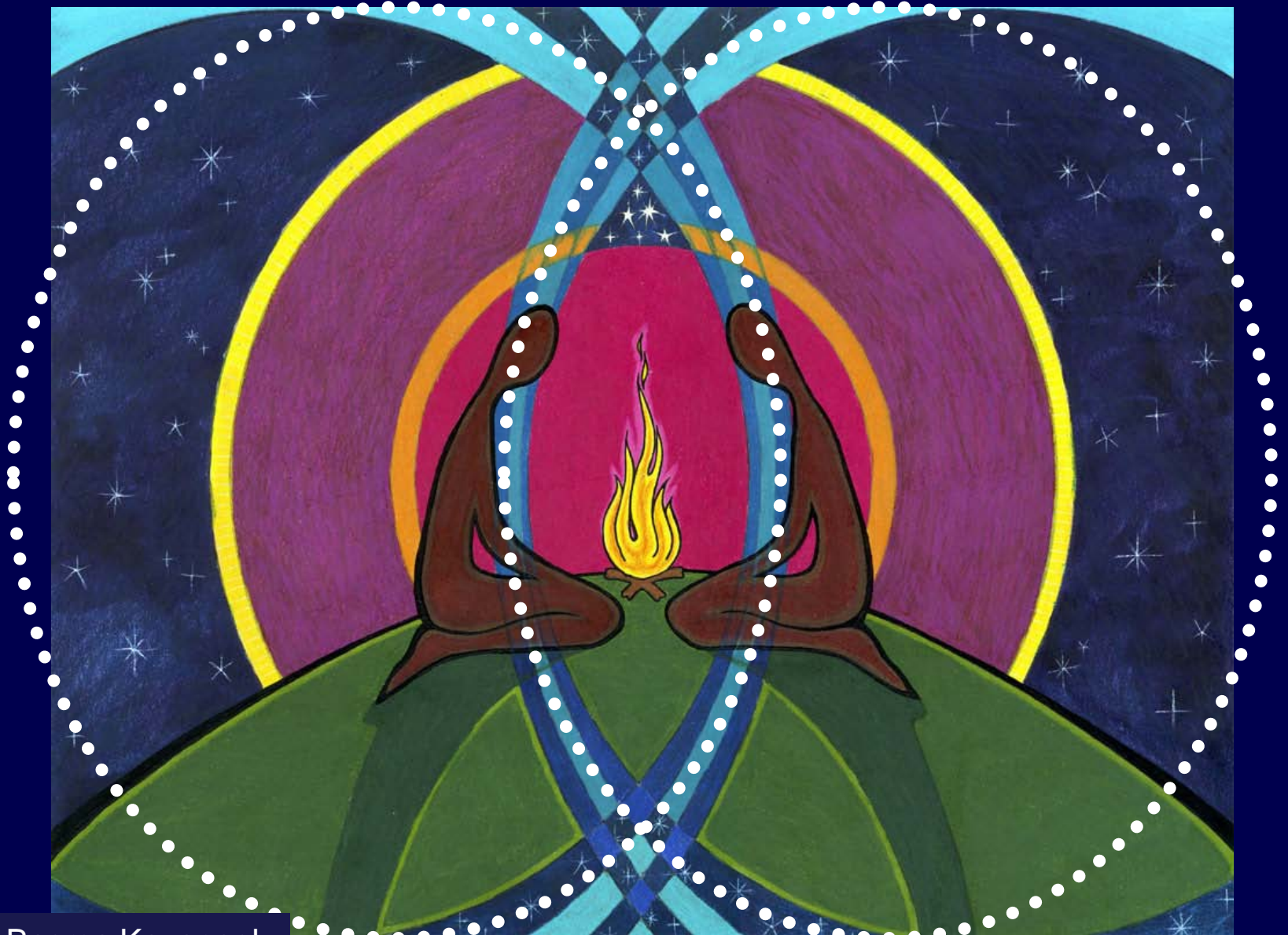
MS+T 101

"Sense of Place, Emergence & Participation"

The Medicine Wheel  
and the Pattern of the Rising Sun



# Integrative Science



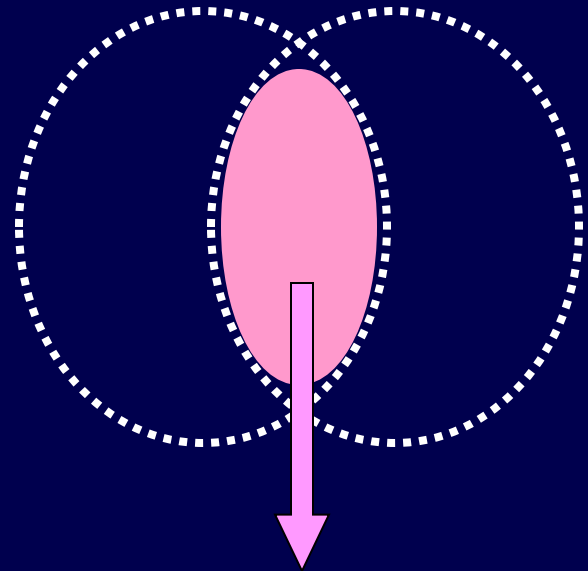
Artist Basma Kavanagh

**Mother  
Earth**



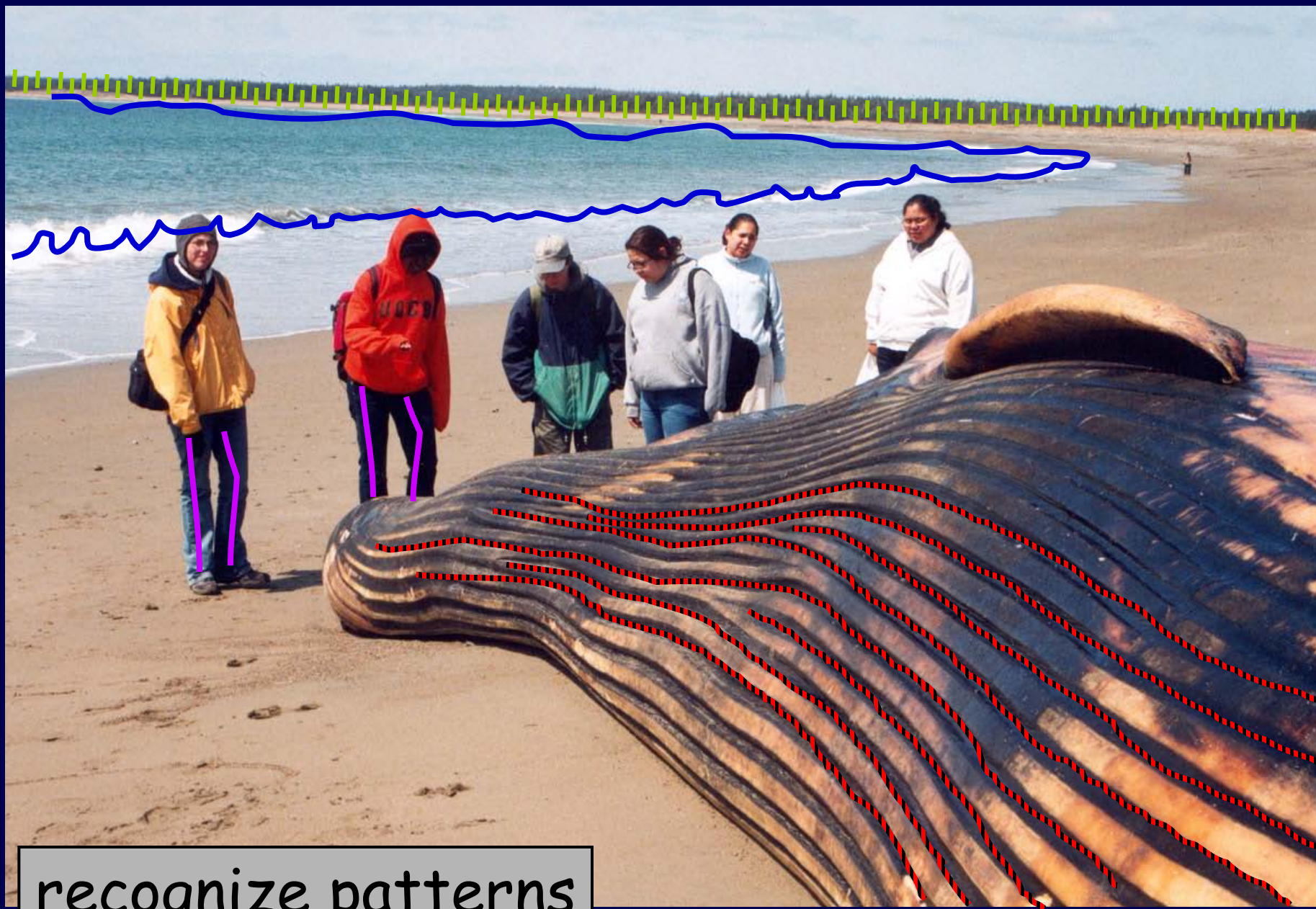
focus on:

**COMMON GROUND**



**PATTERN**

**PATTERN RECOGNITION**



recognize patterns



recognize patterns



express patterns

# CONCEPTUAL FRAMEWORK

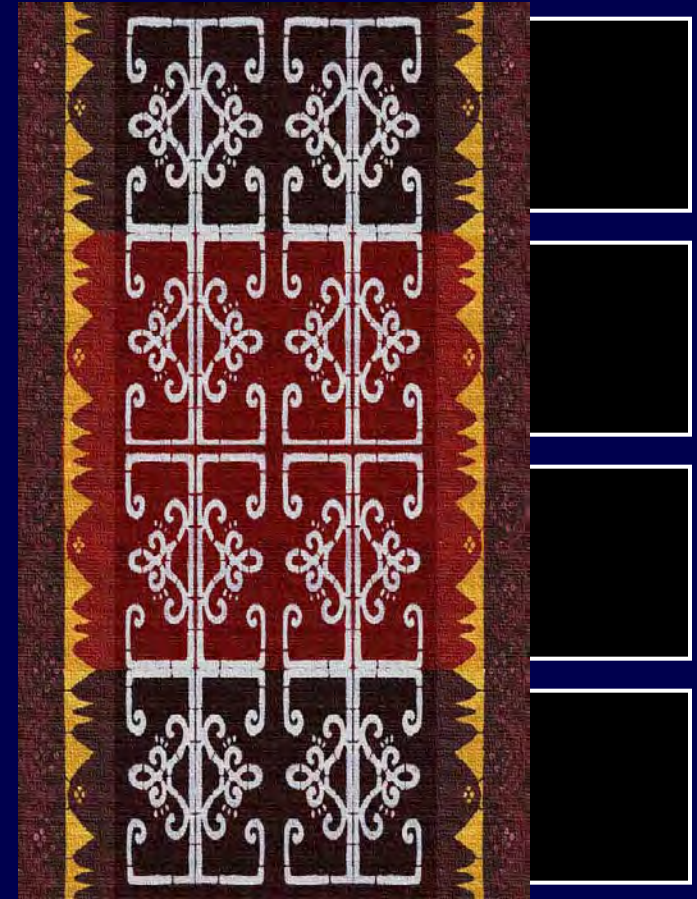
natural



ideal



abstract



recognize patterns

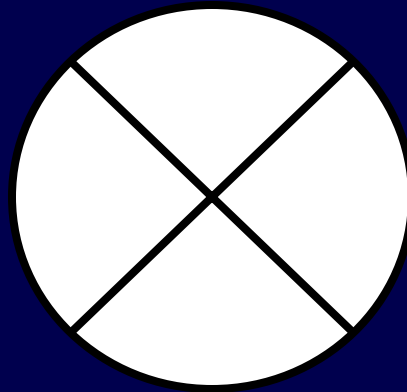
express patterns

# CONCEPTUAL FRAMEWORK

natural



ideal



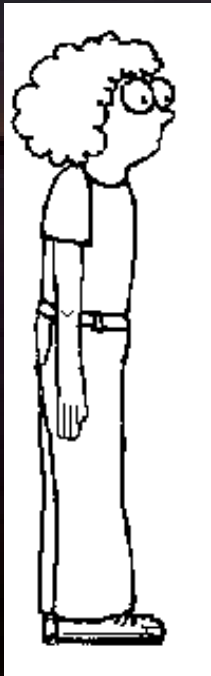
abstract



**PATTERN**

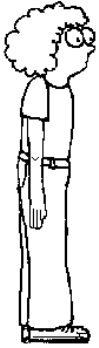


# The Medicine Wheel and the Pattern of the Rising Sun



# Personal

(from above)

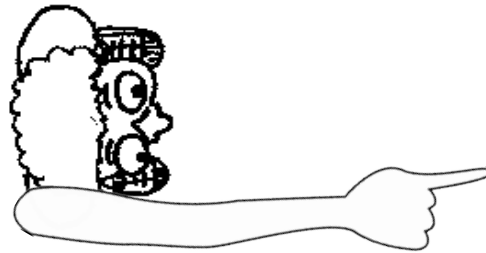


Personal

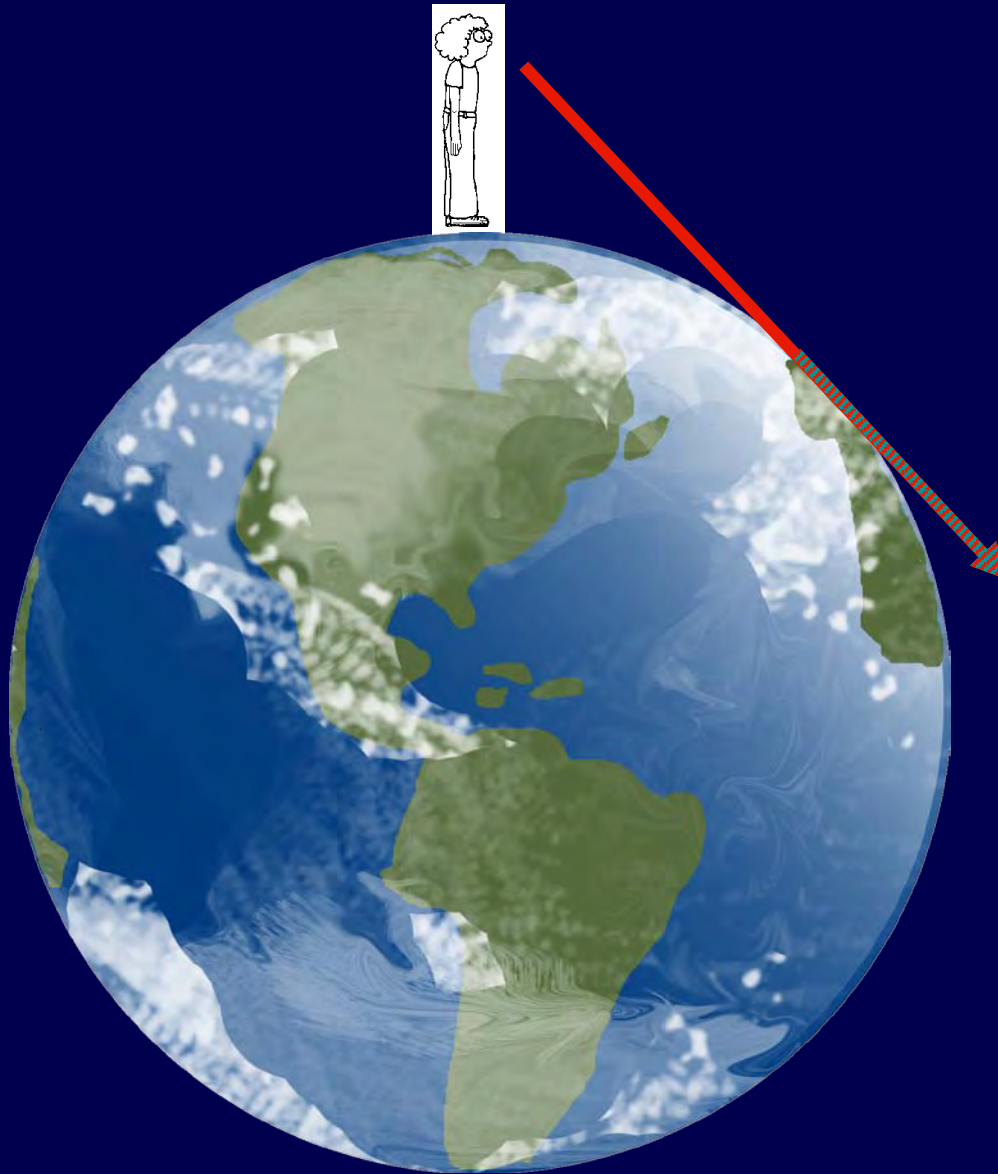
MSIT 101

"Sense of Place, Emergence & Participation"

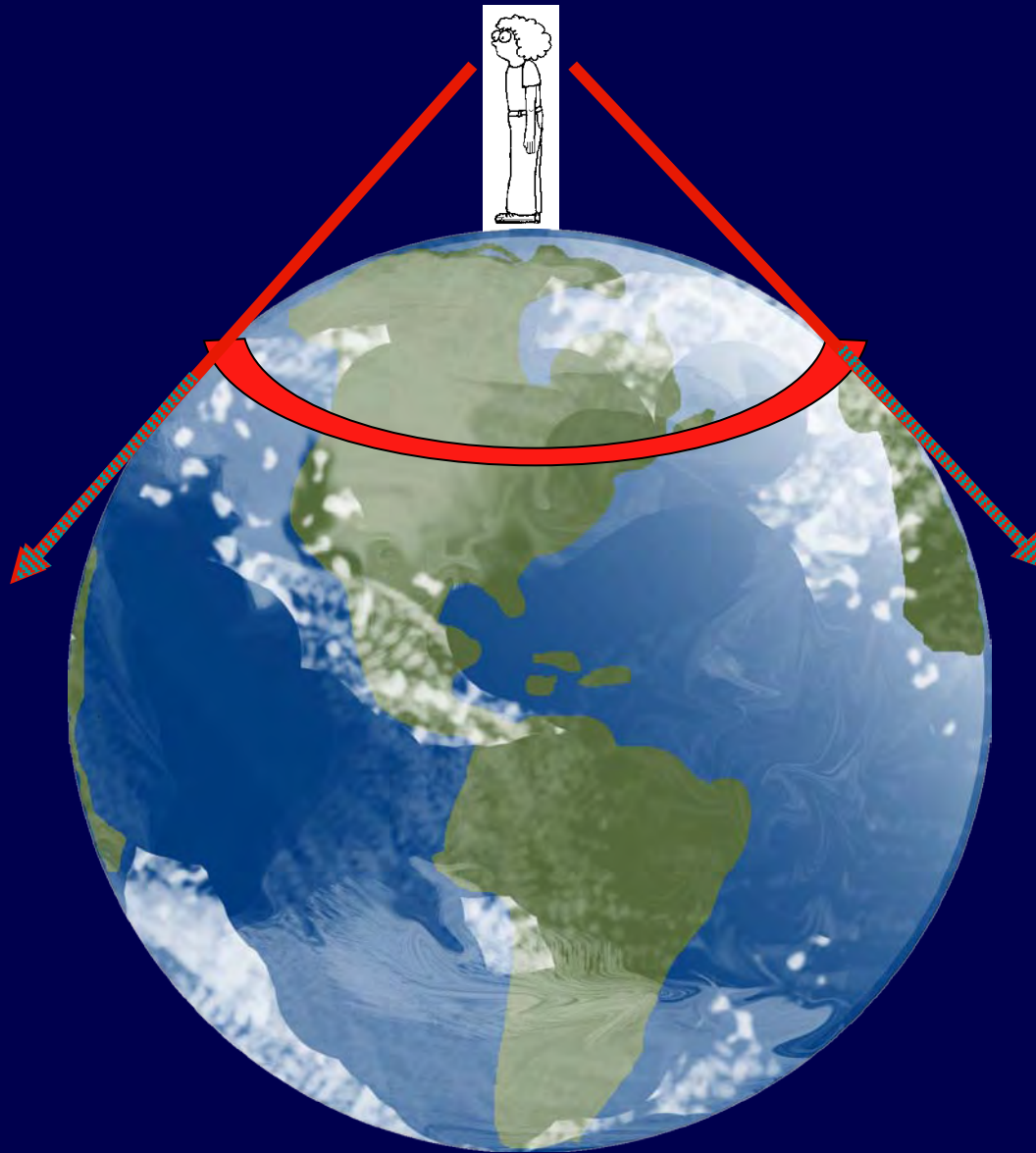
PLACE



what is the **HORIZON** ?



what is the **HORIZON** ?



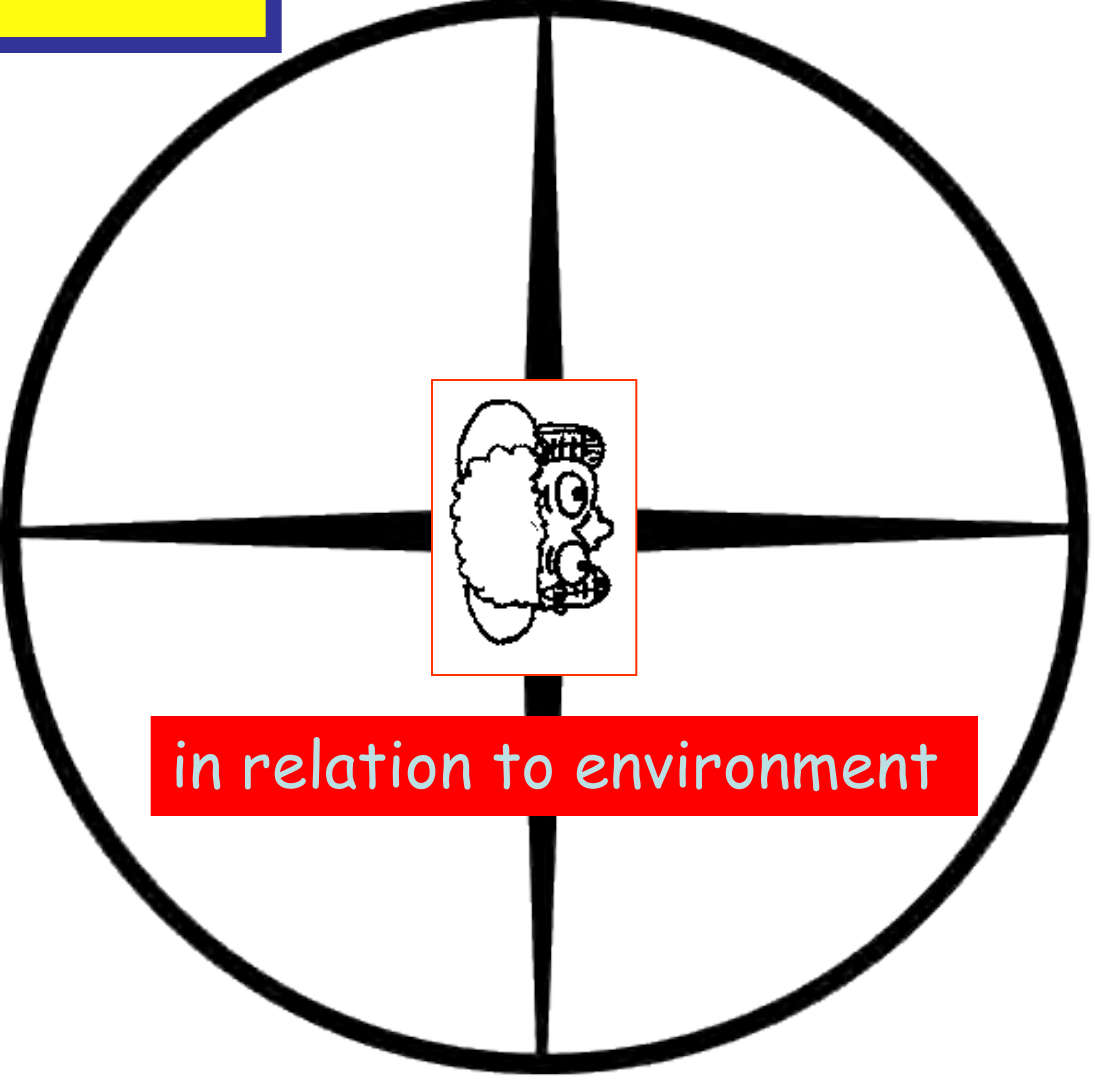


# Directional

North

East

West



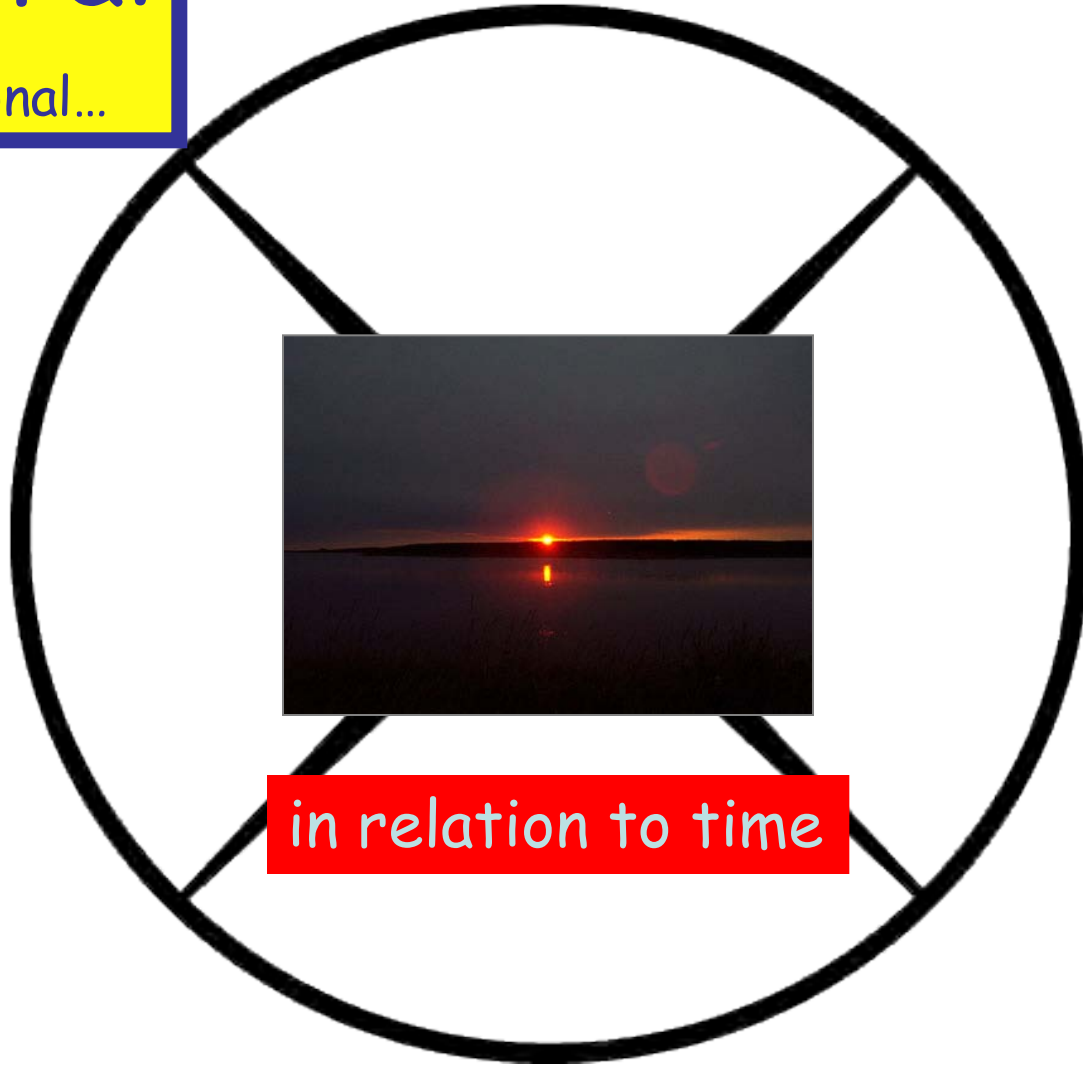
in relation to environment

South



# Temporal

and Directional...

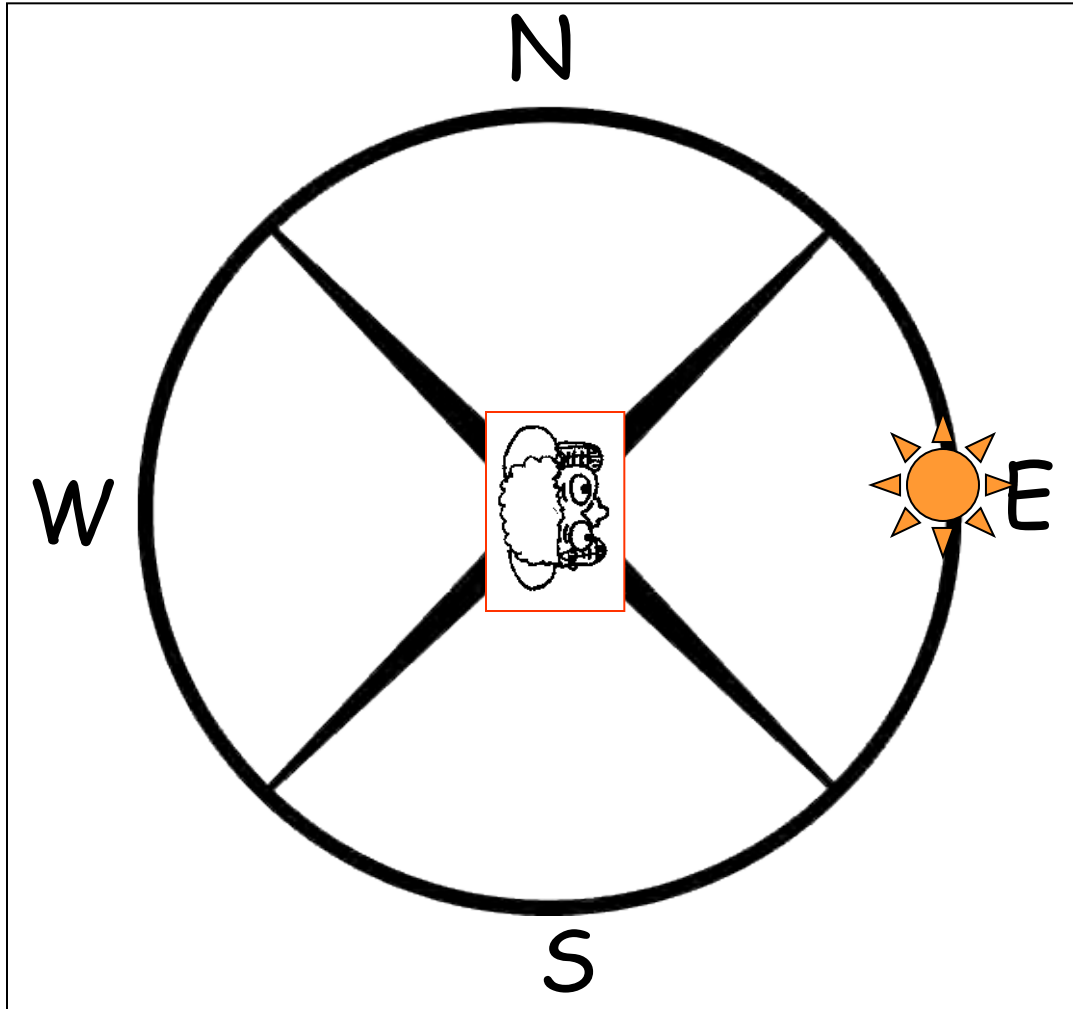


in relation to time

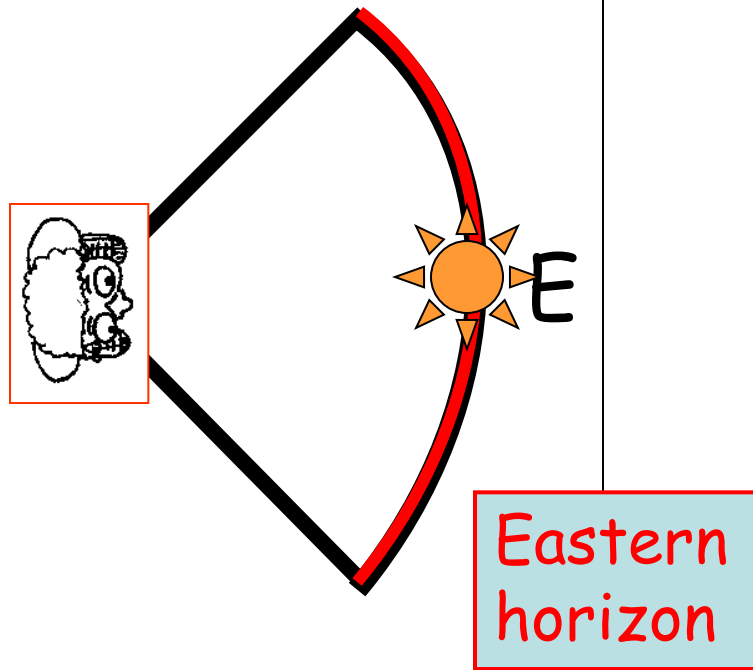


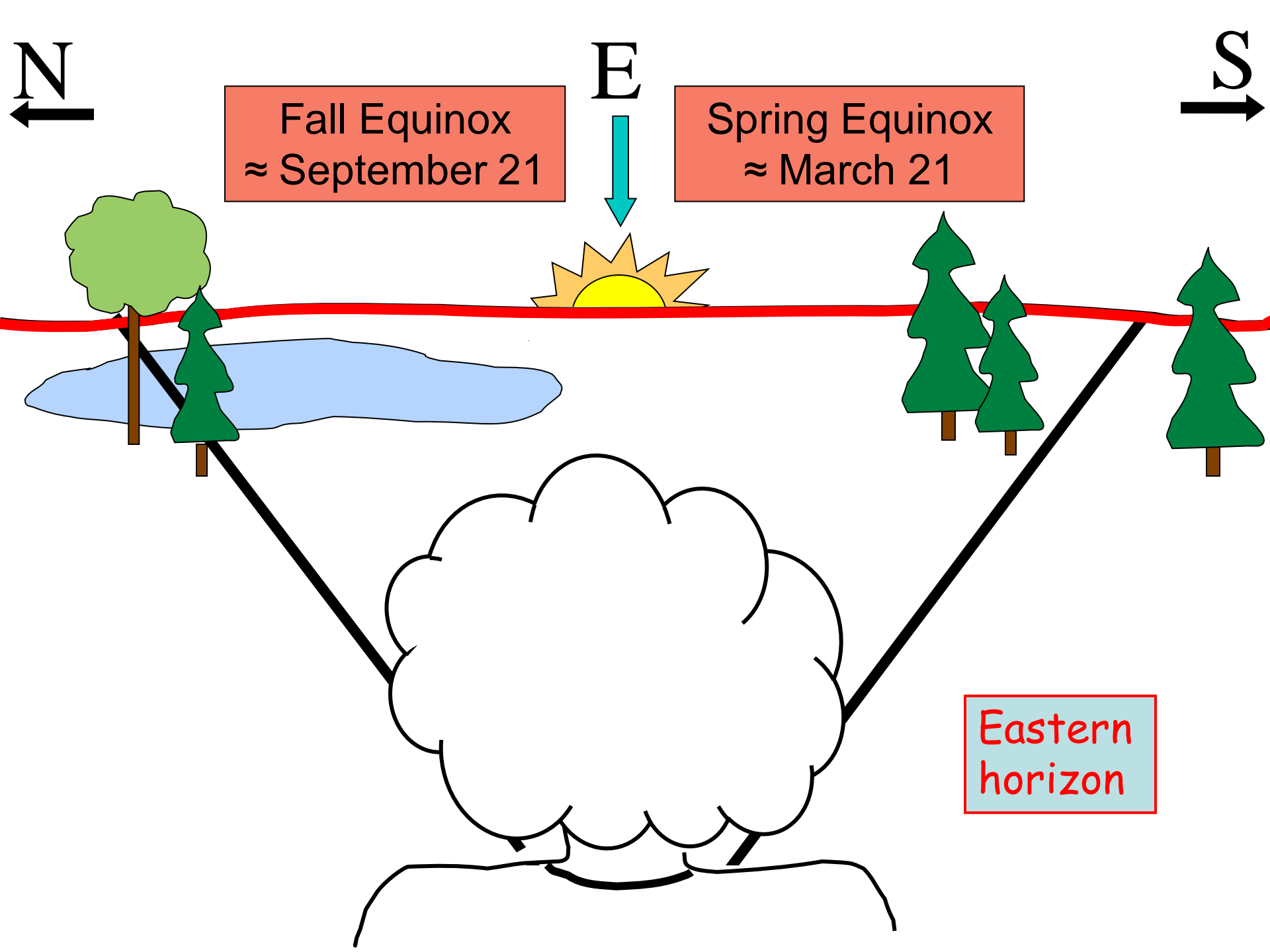


rising Sun:  
natural pattern ... 1 year



rising Sun:  
natural pattern ... 1 year





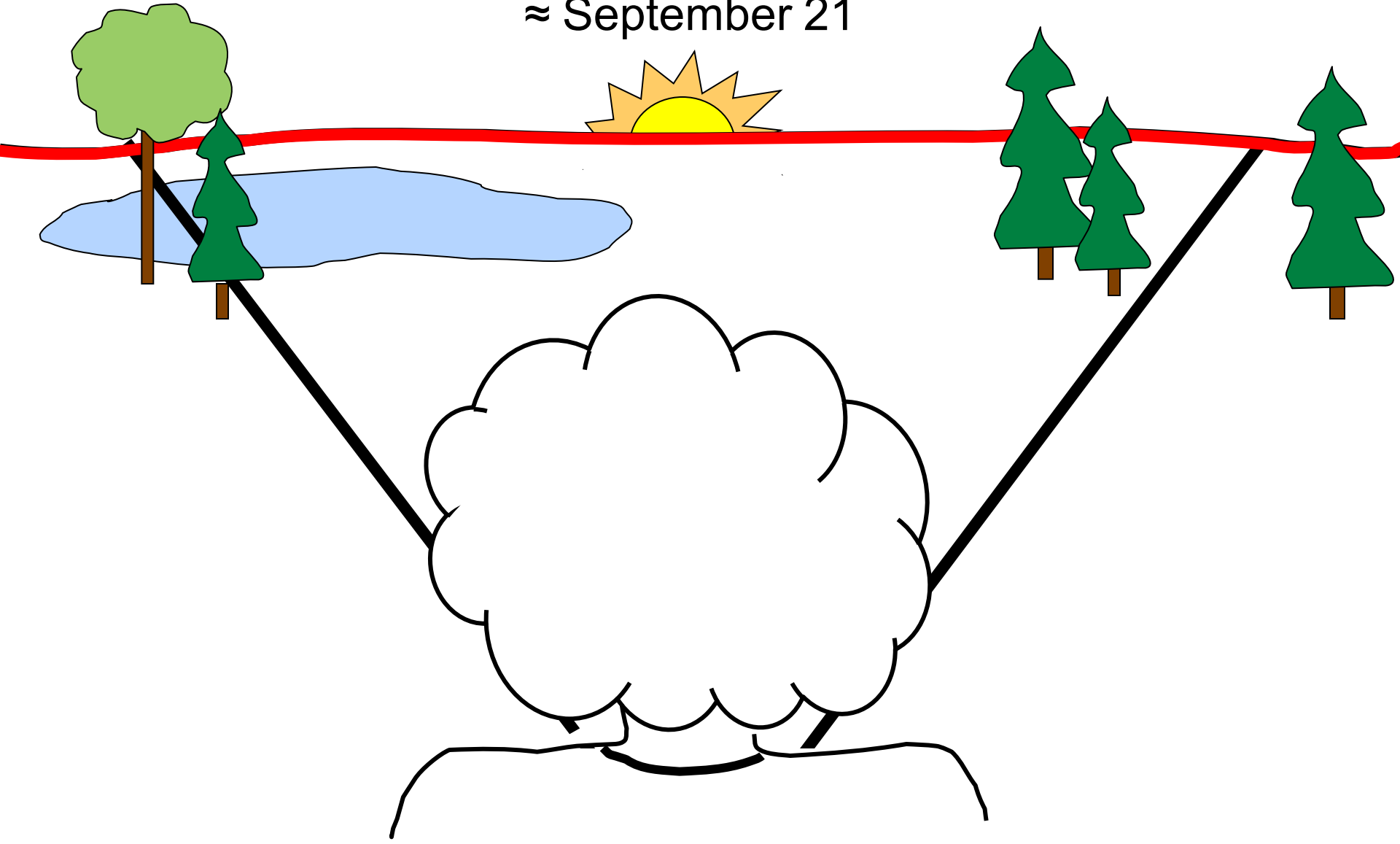
Fall Equinox  
≈ September 21

Spring Equinox  
≈ March 21

Eastern  
horizon

# E

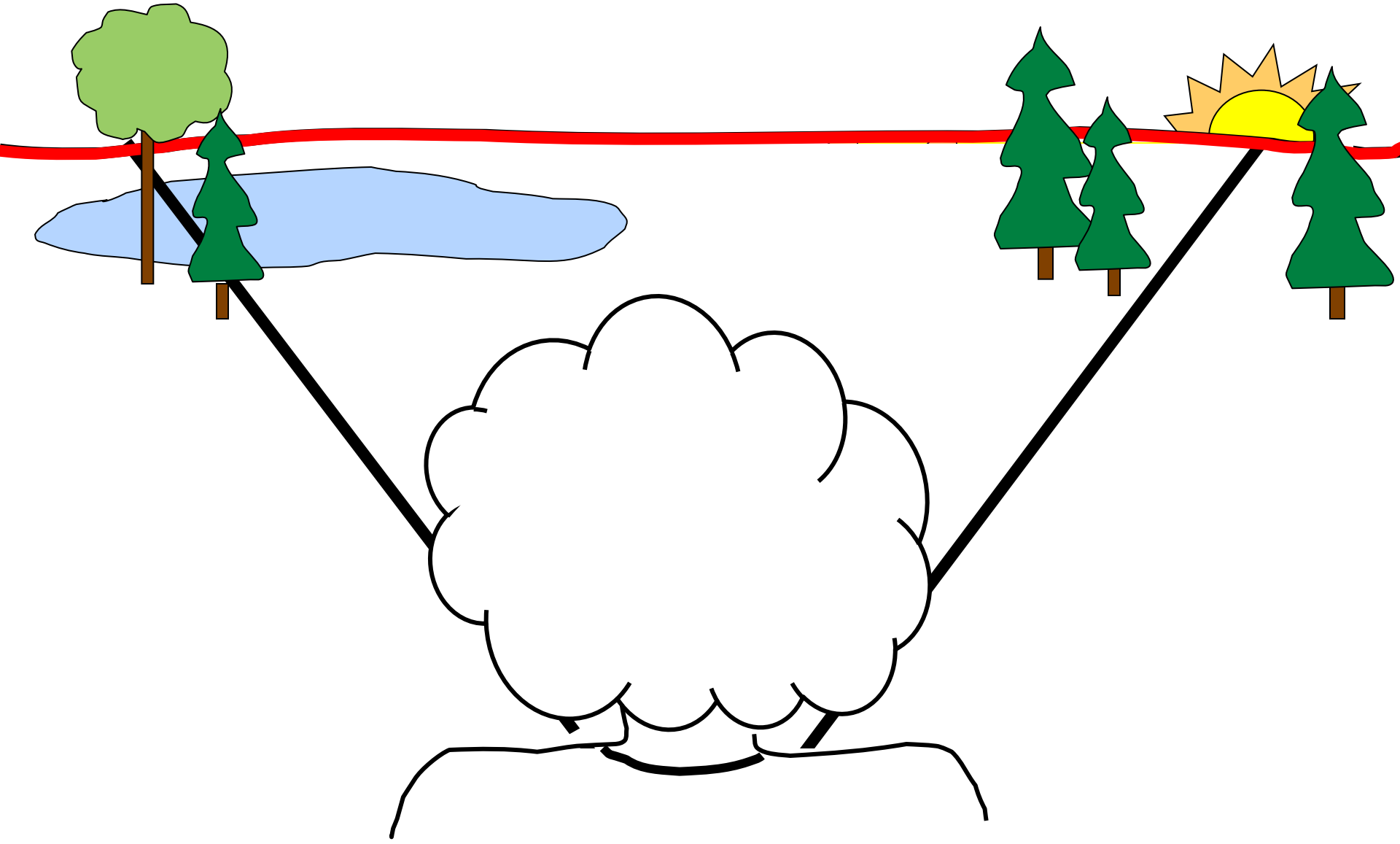
Fall Equinox  
≈ September 21



E

Winter Solstice  
≈ December 21

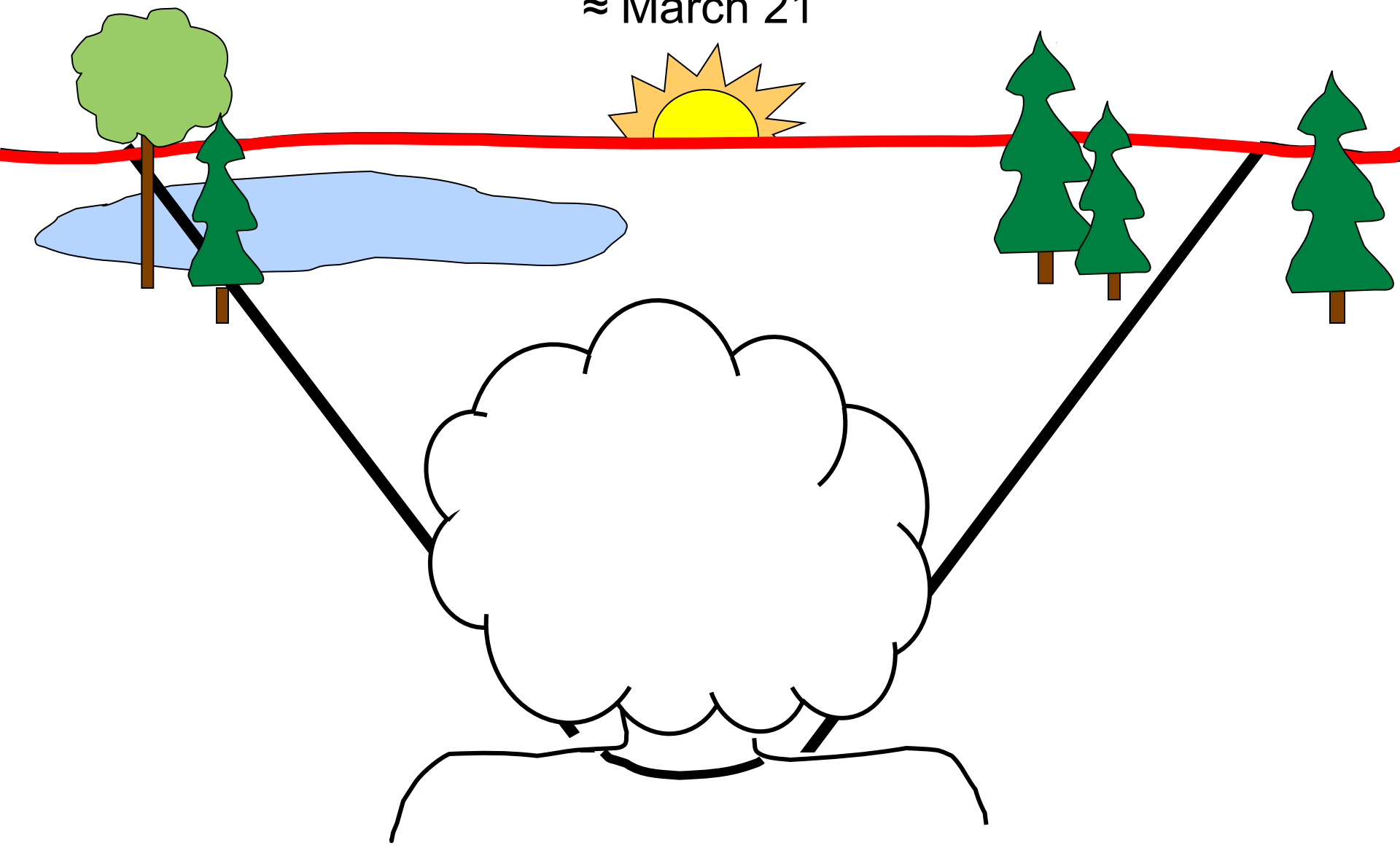
S  
↓



N  
↑

E

Spring Equinox  
≈ March 21

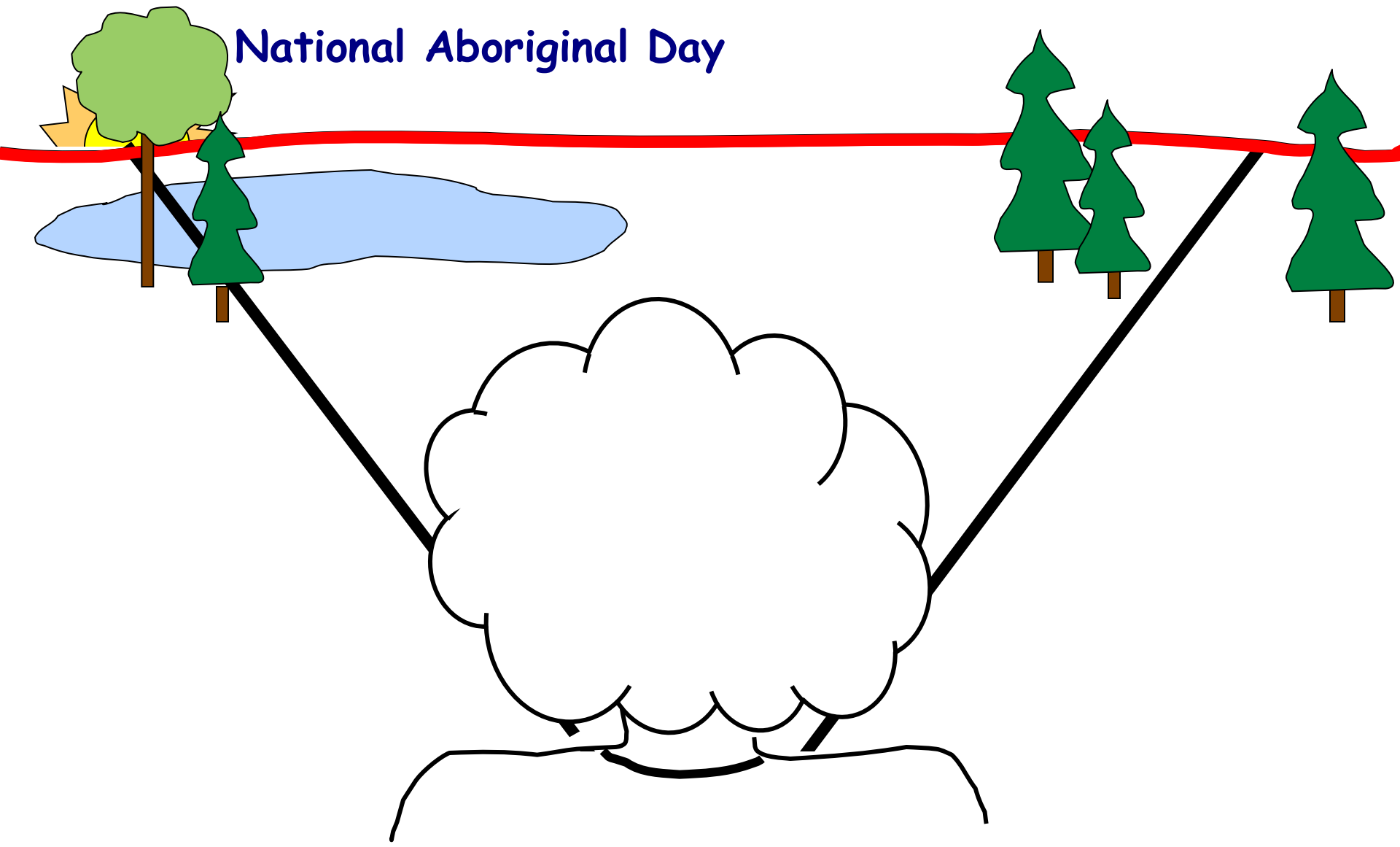




E

Summer Solstice  
≈ June 21

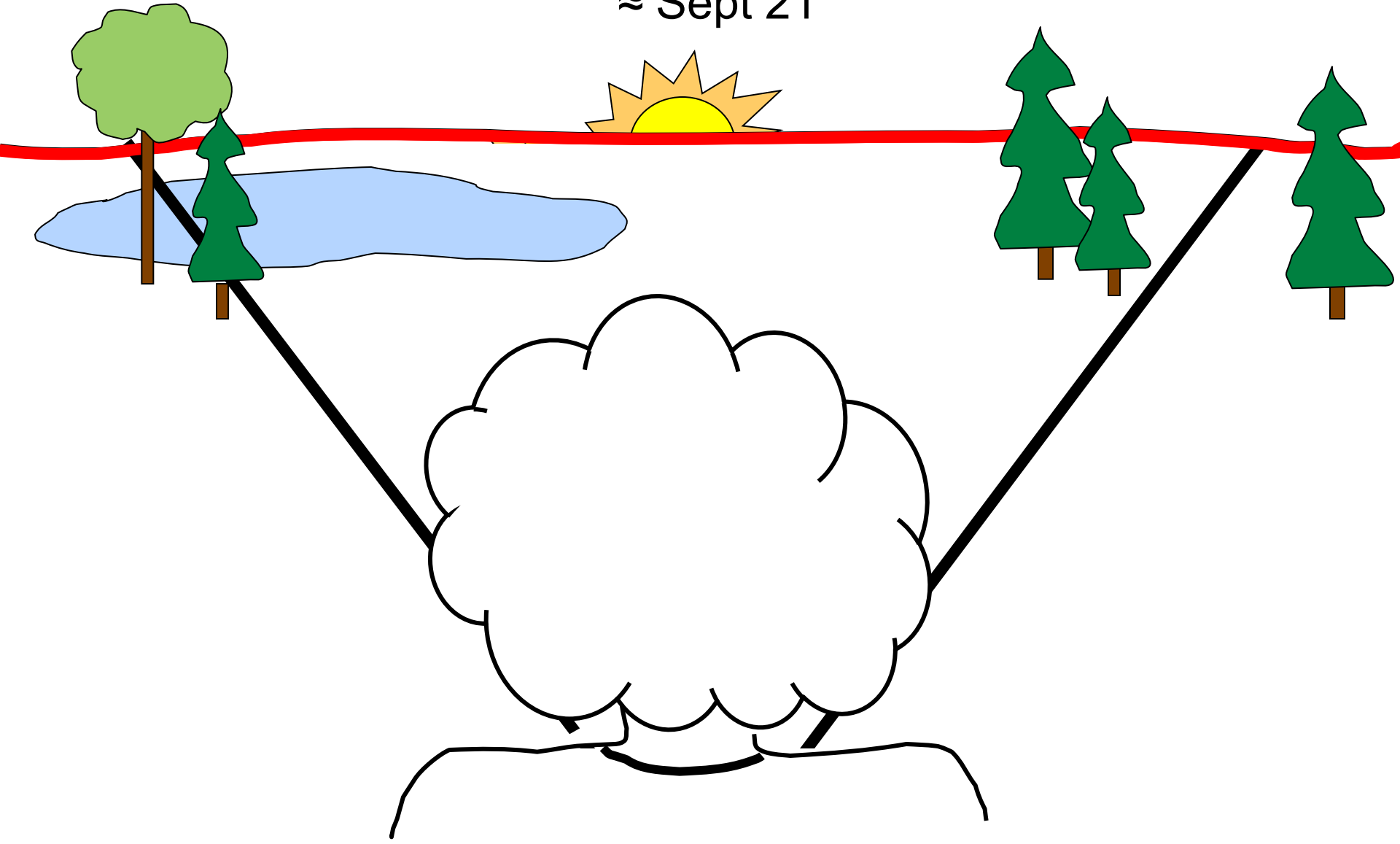
National Aboriginal Day



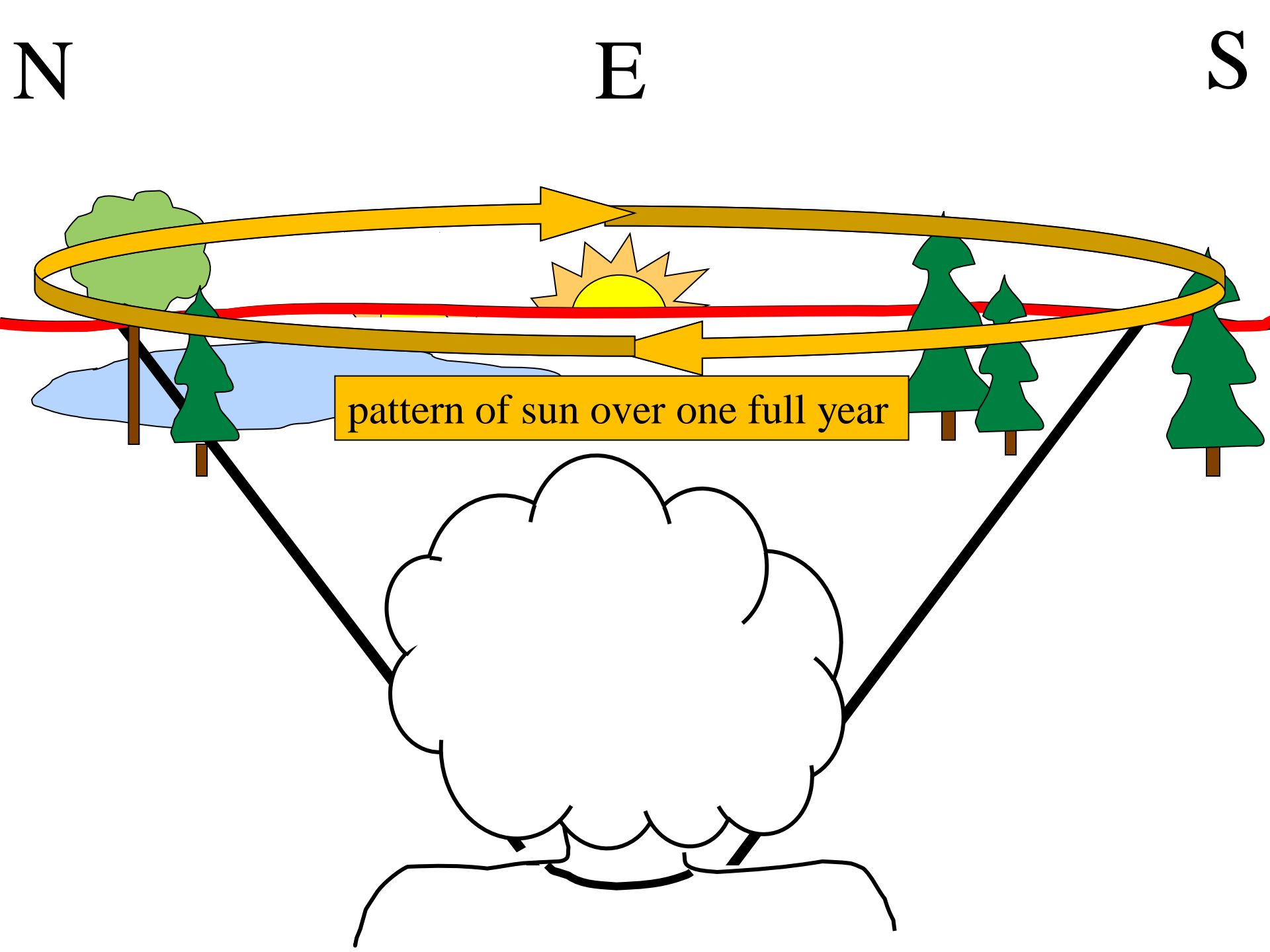
E

Fall Equinox  
≈ Sept 21

S  
↓







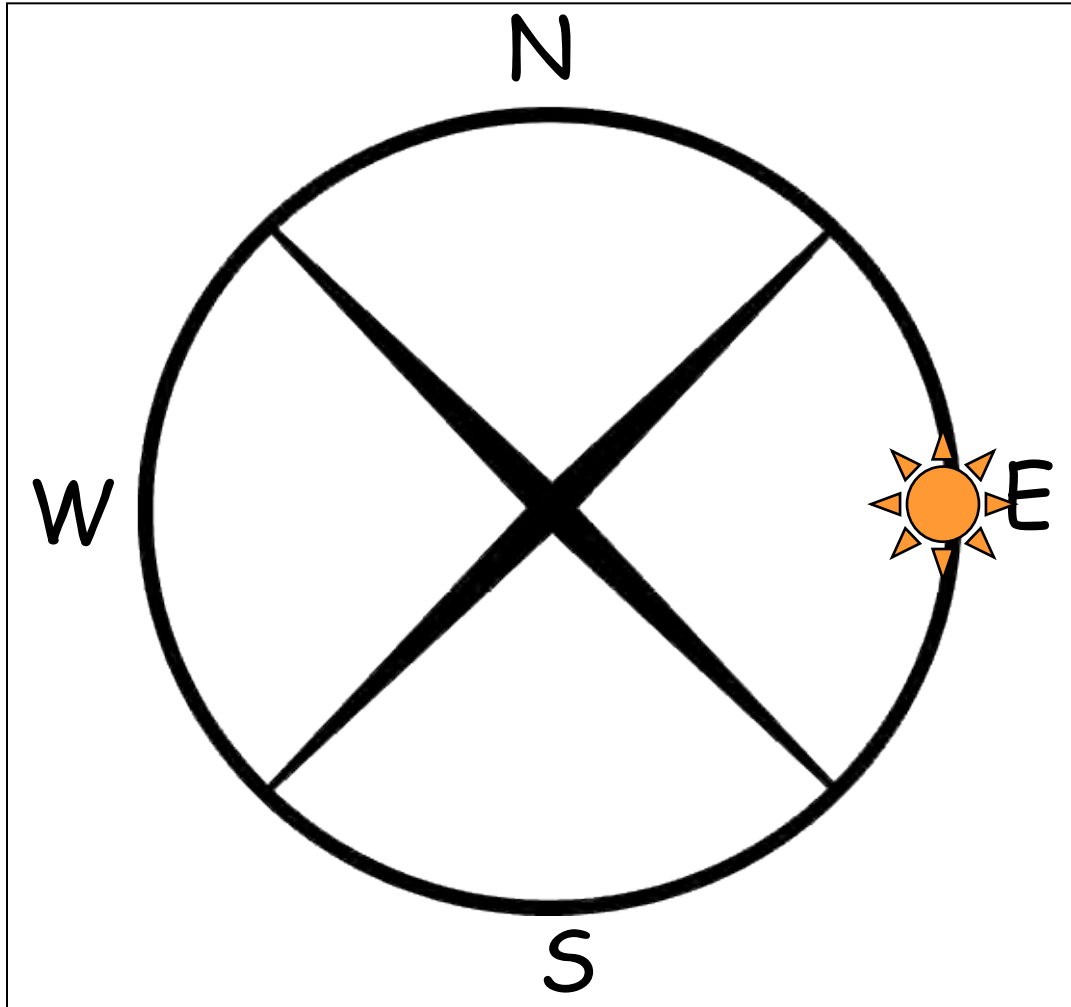
N

E

S

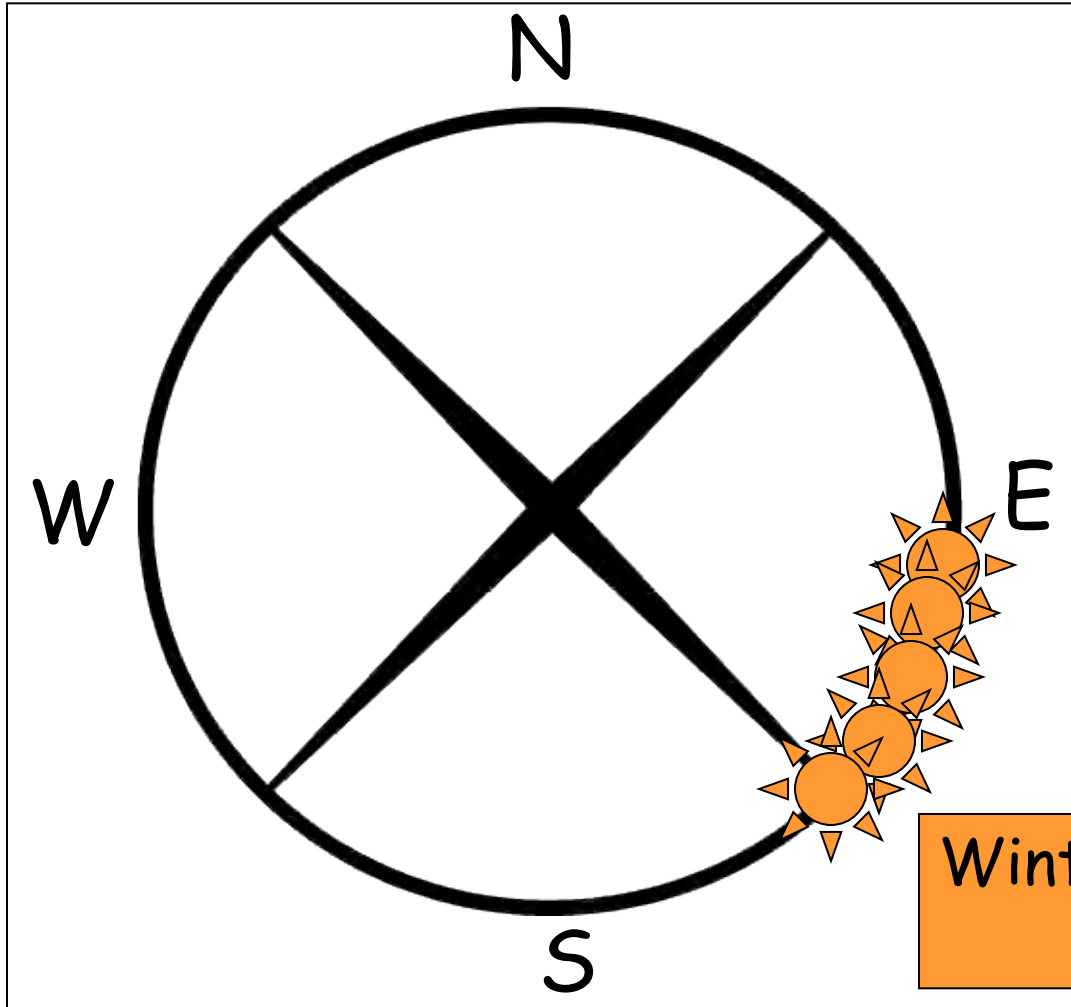
pattern of sun over one full year

rising Sun:  
natural pattern ... 1 year



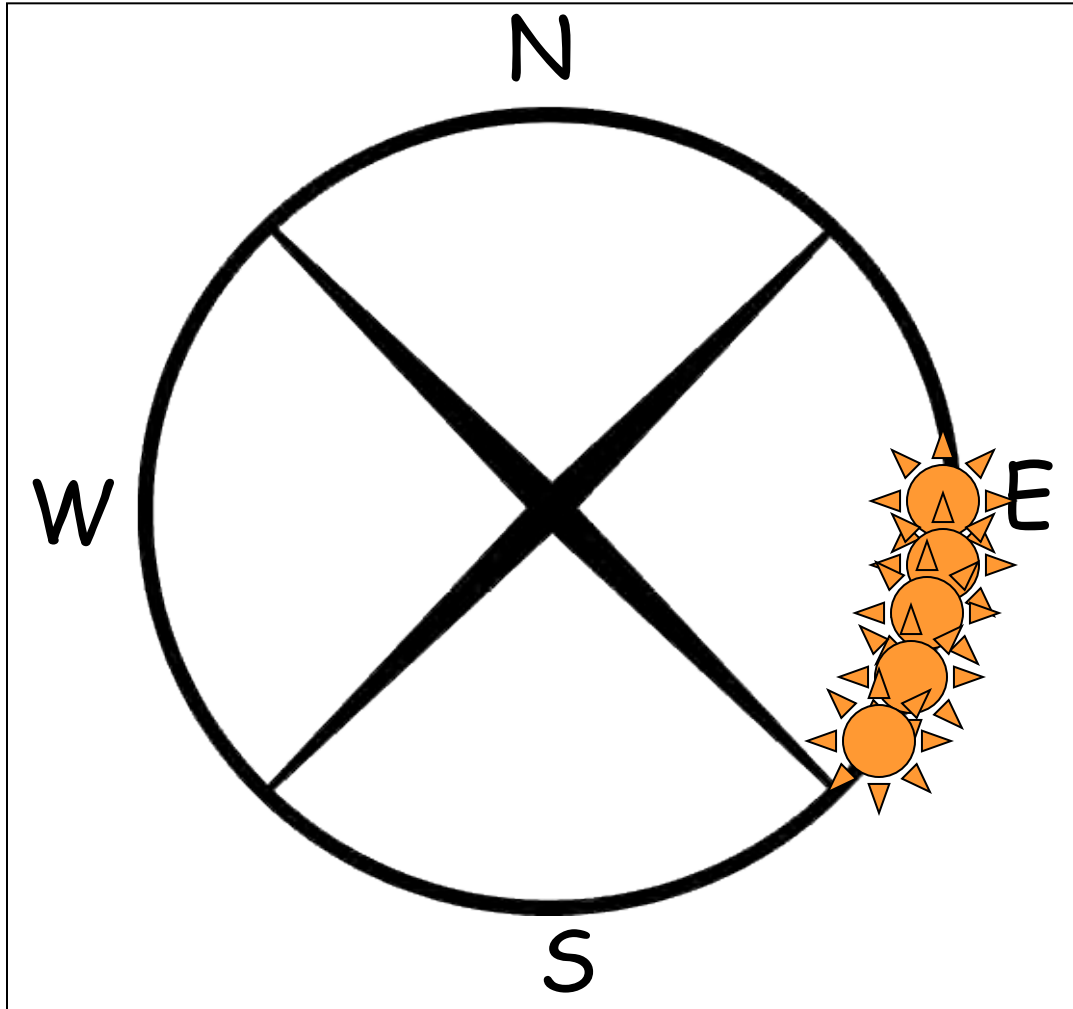
Fall Equinox  
≈ September 21

rising Sun:  
natural pattern ... 1 year



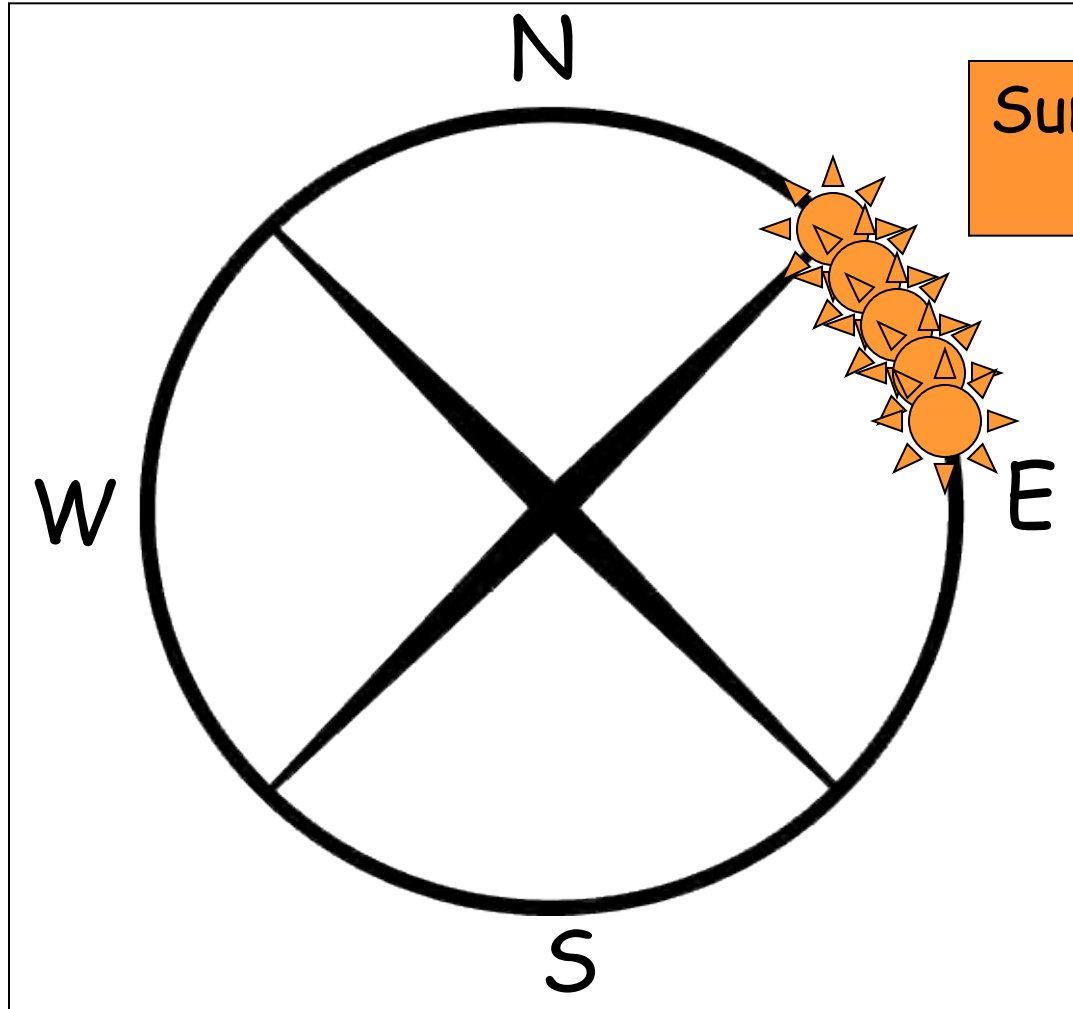
Winter Solstice  
≈ December 21

rising Sun:  
natural pattern ... 1 year



Spring Equinox  
≈ March 21

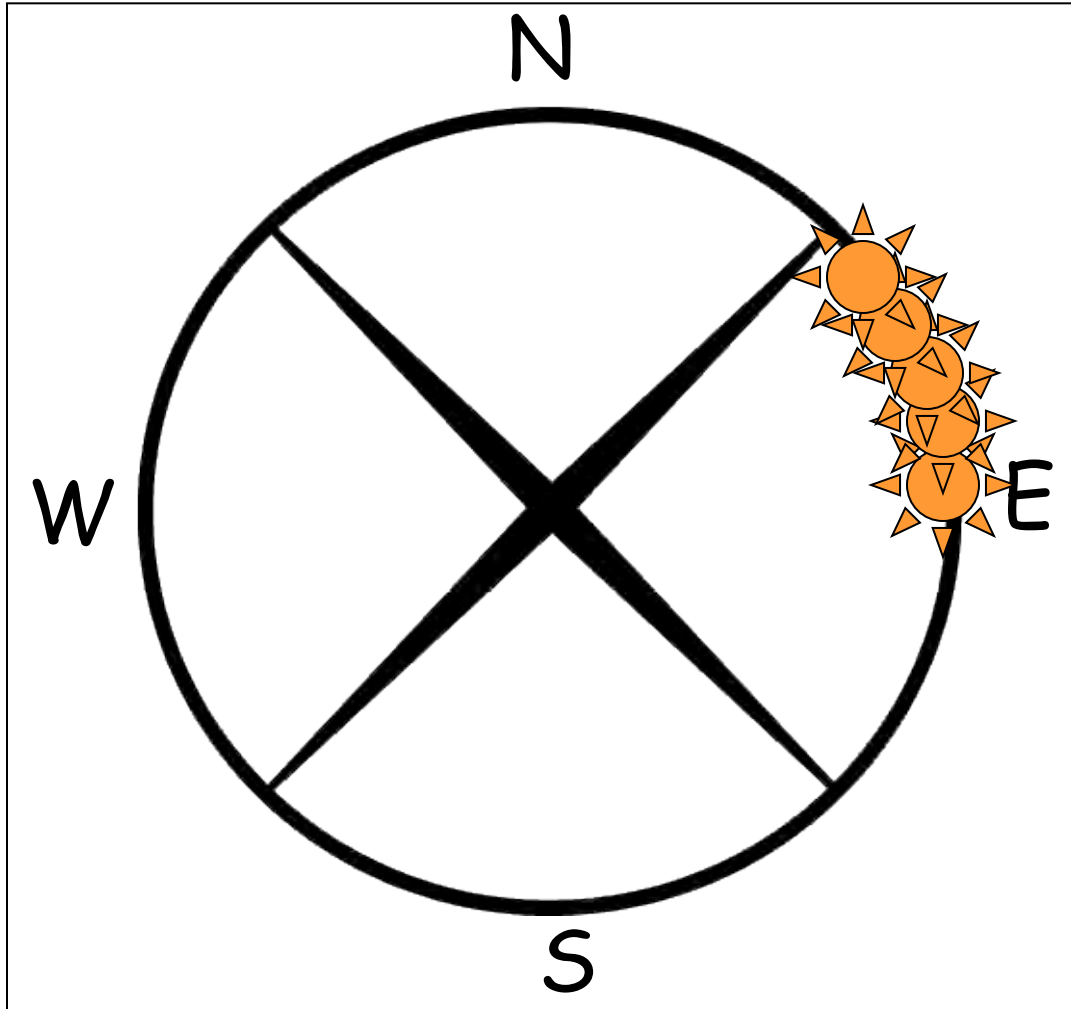
rising Sun:  
natural pattern ... 1 year



Summer Solstice  
≈ June 21

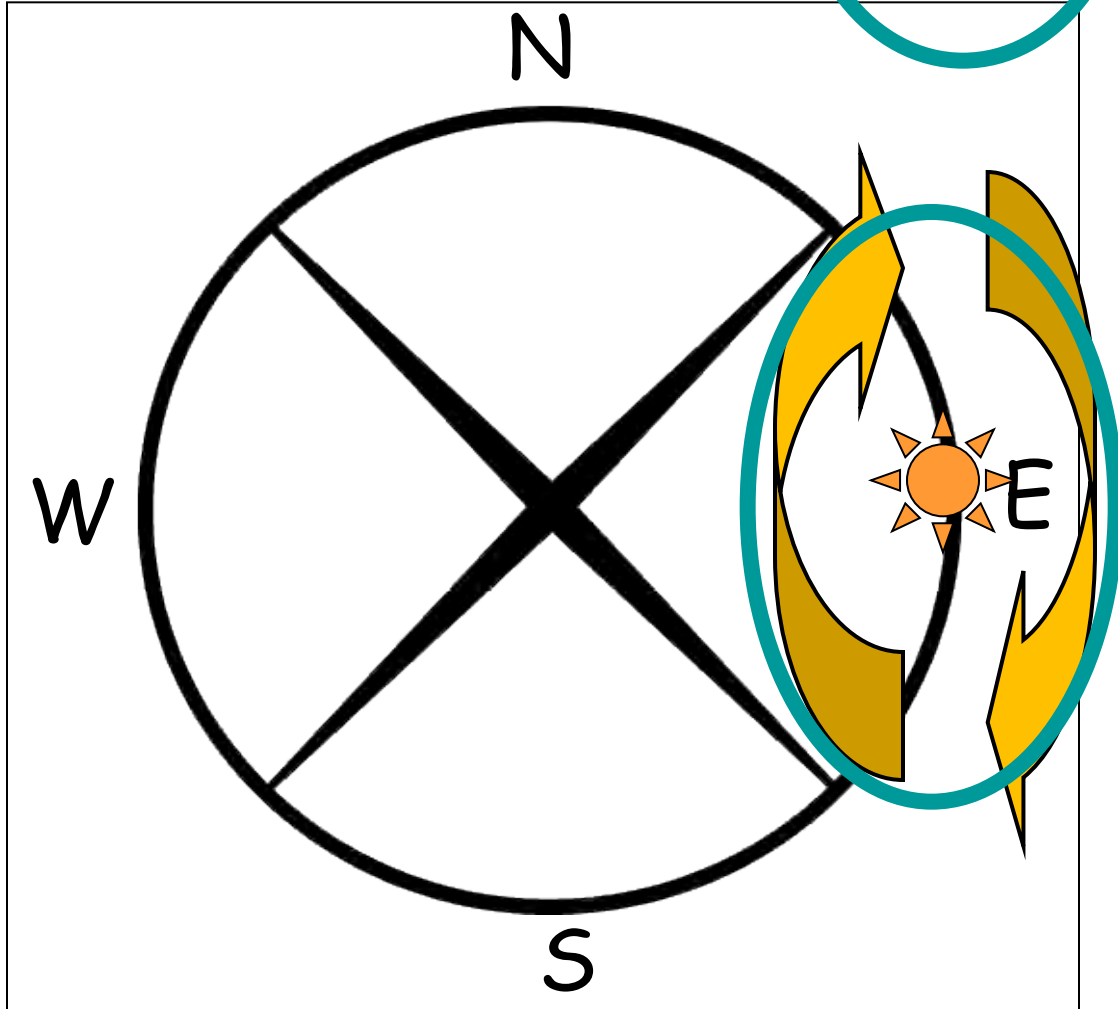


rising Sun:  
natural pattern ... 1 year



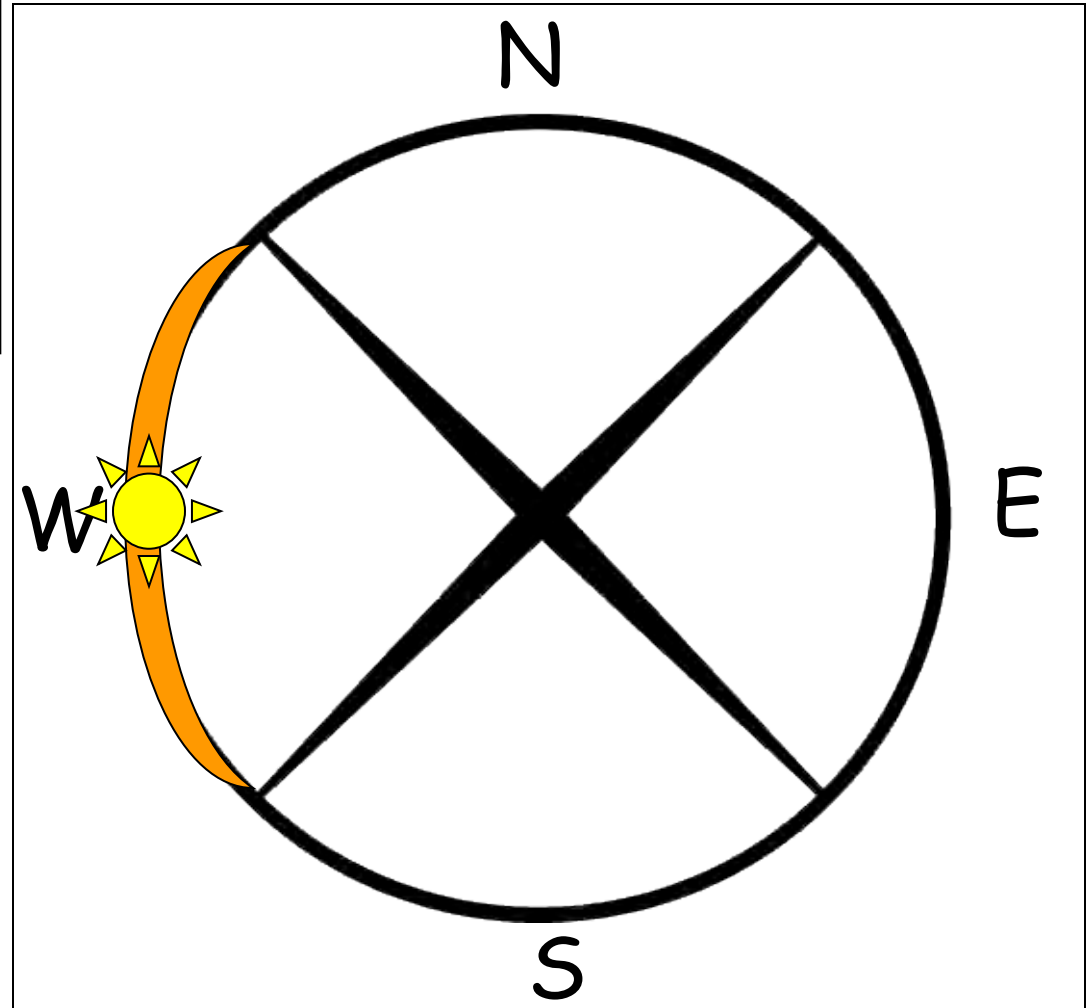
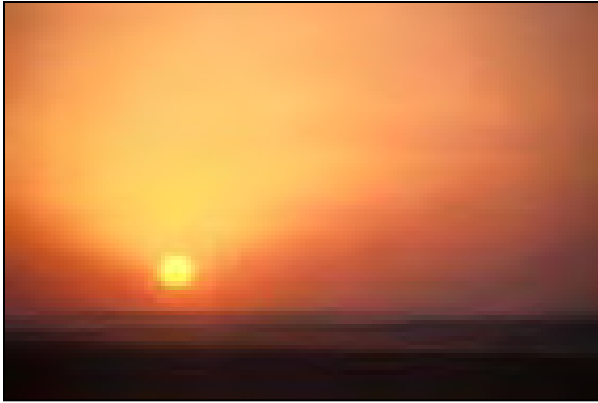
Fall Equinox  
≈ September 21

rising Sun:  
natural pattern .. 1 year



pattern of setting Sun:

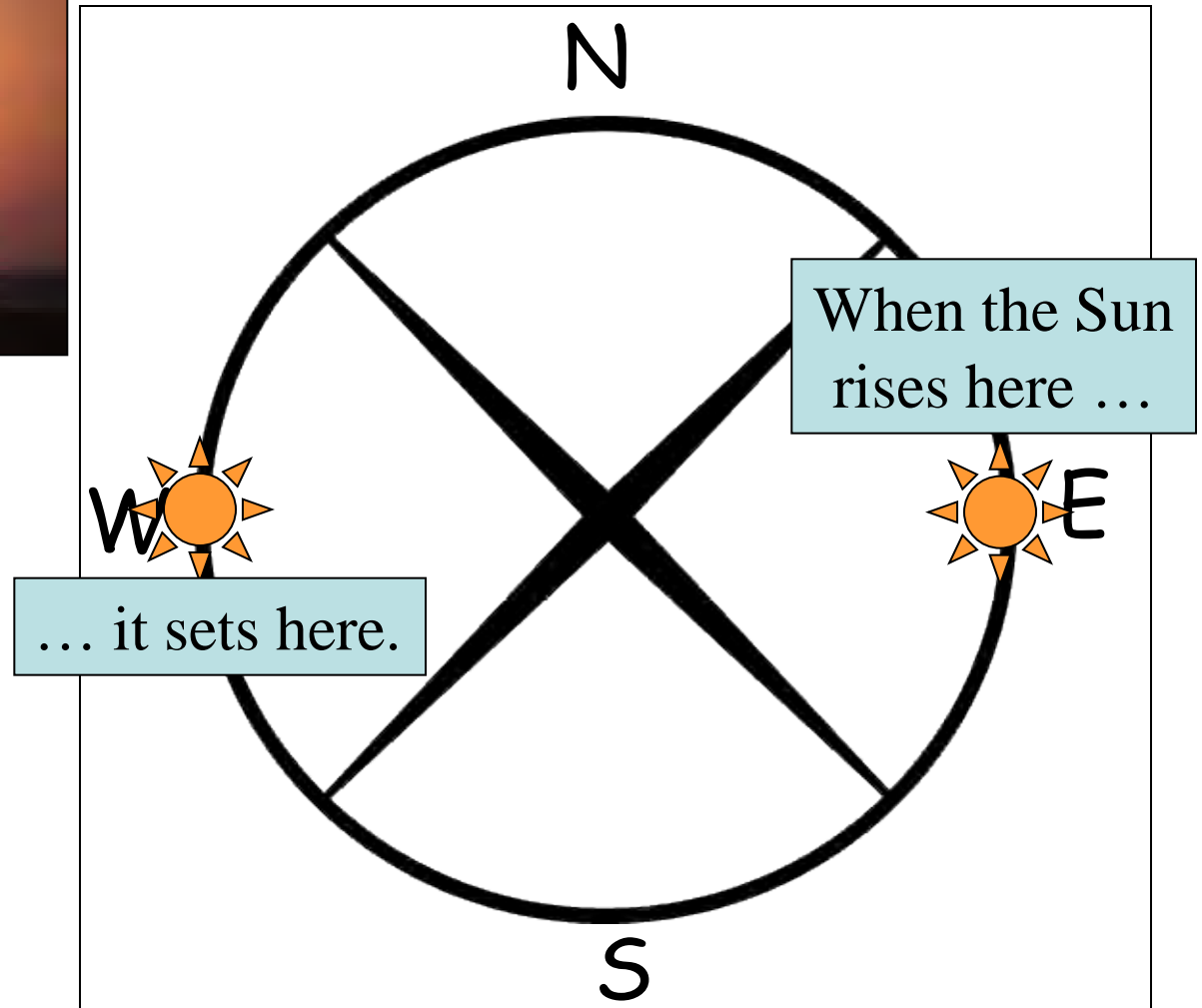
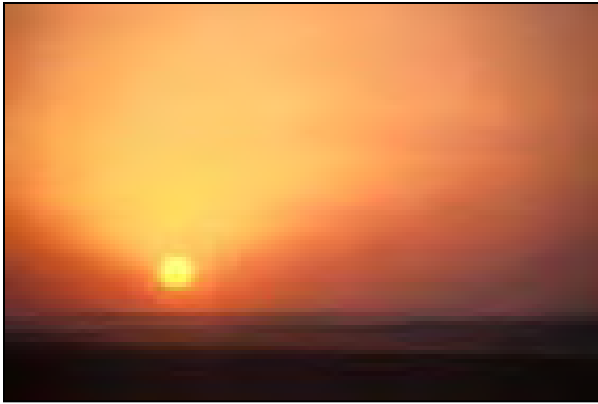
Western horizon





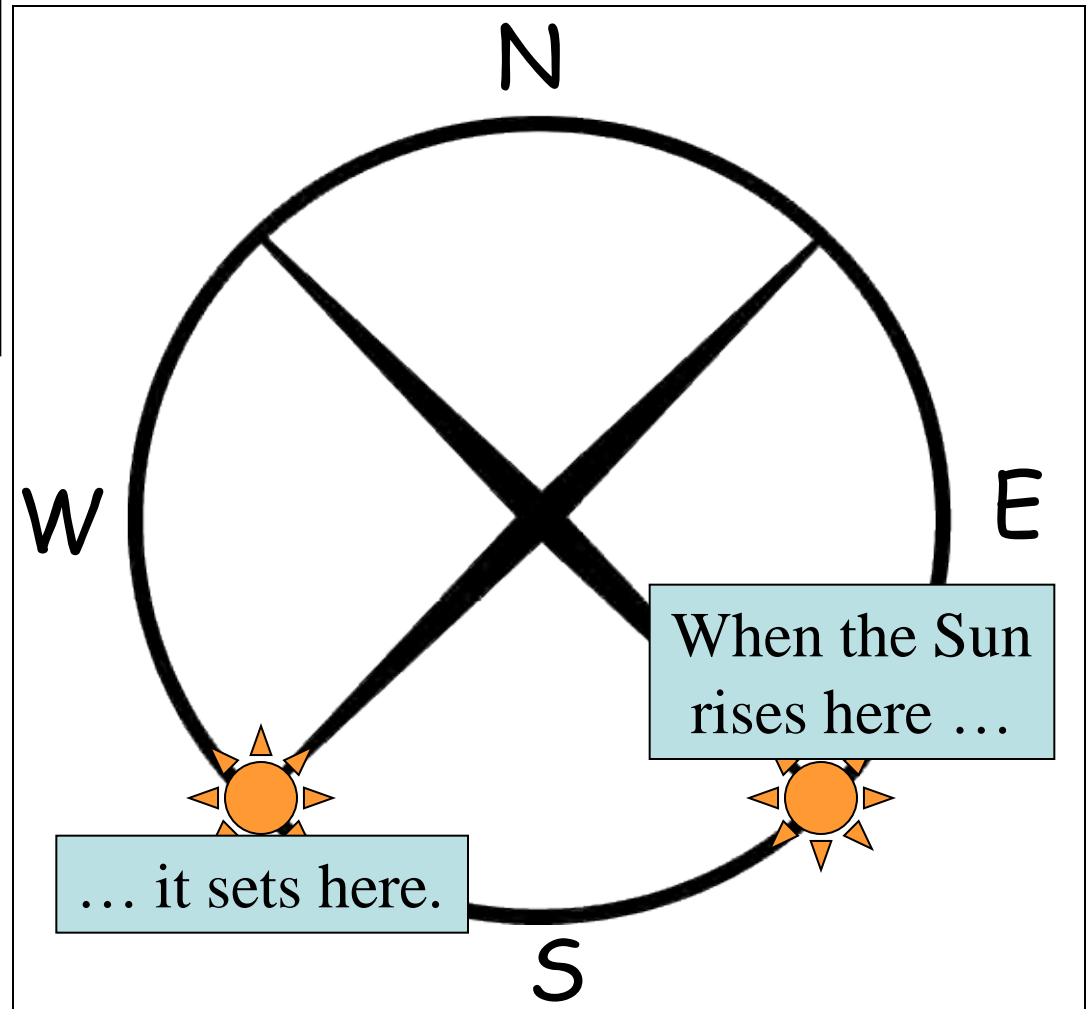
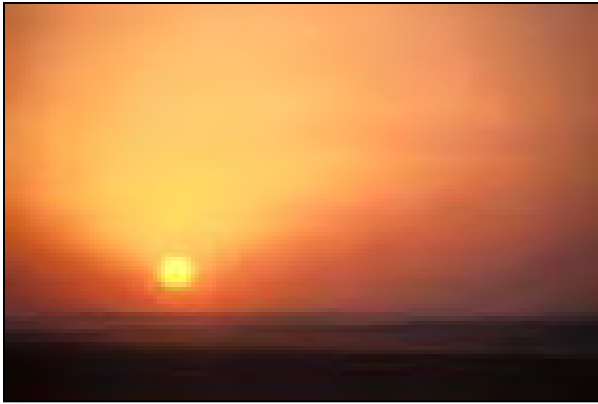
pattern of setting Sun:

Western horizon



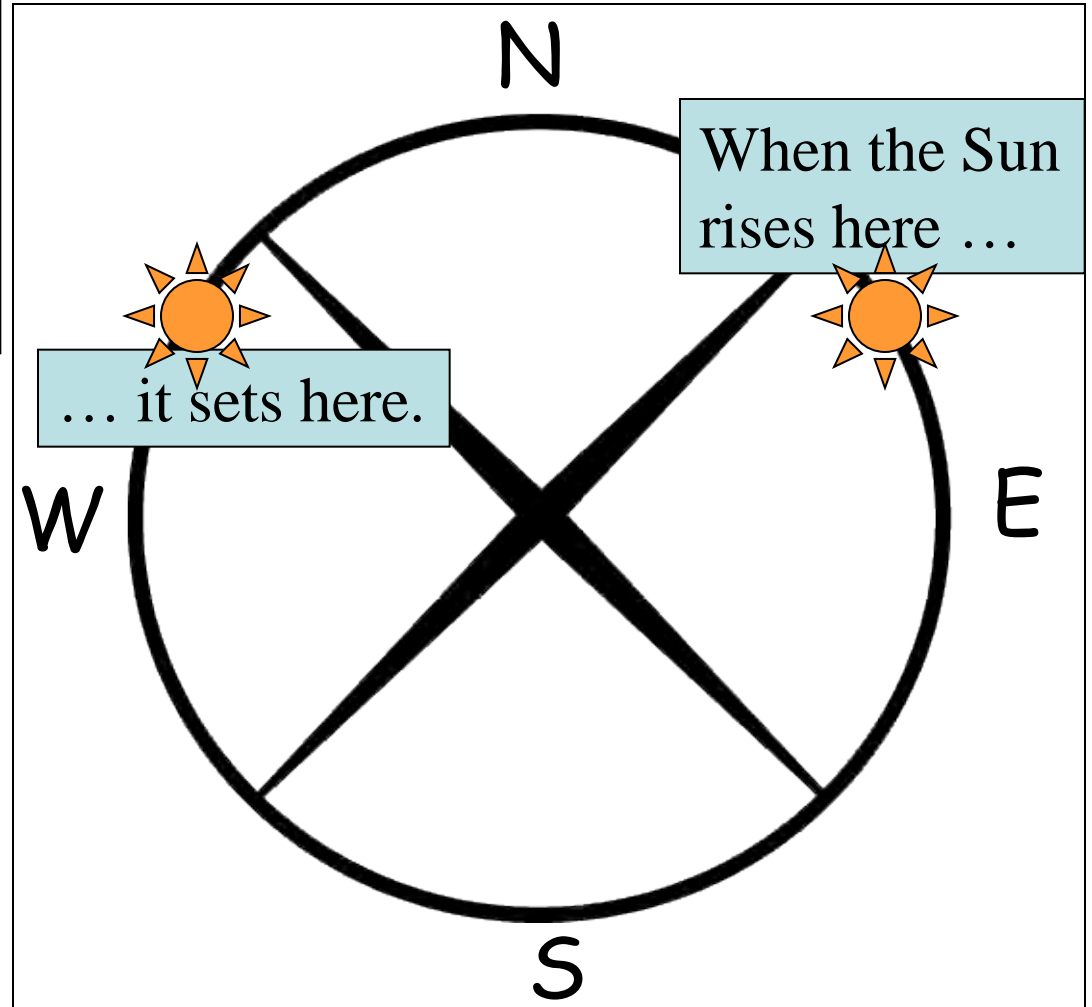
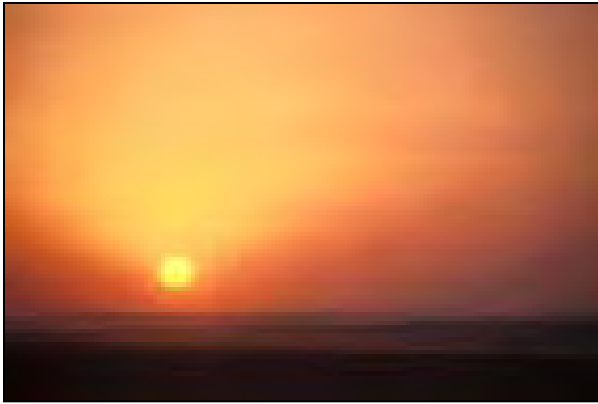
# pattern of setting Sun:

## Western horizon



pattern of setting Sun:

Western horizon



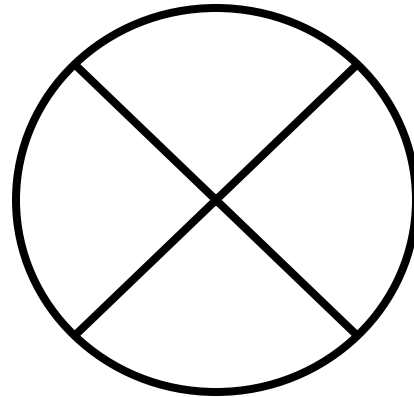


*Medicine Wheel* ... based on layered **pattern**:

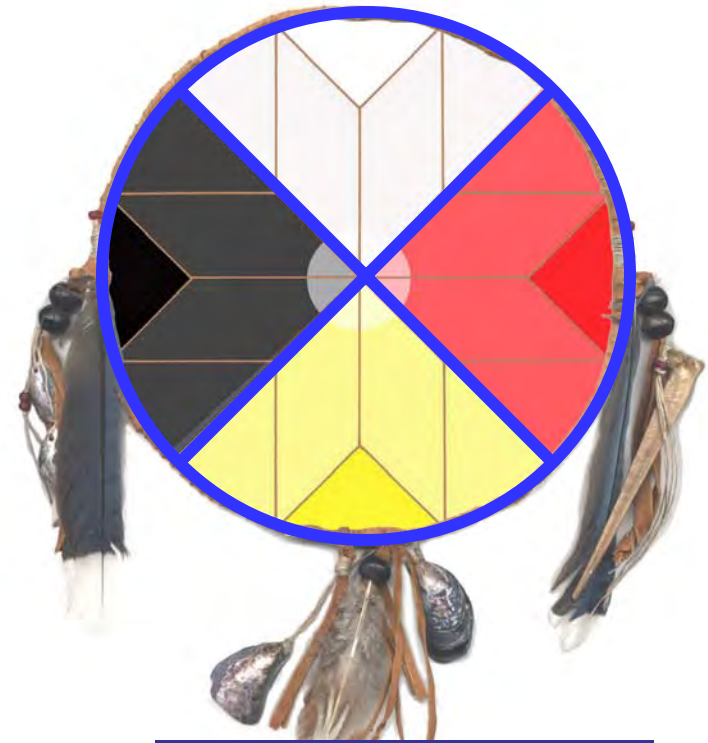
natural



ideal




abstract



**PATTERN**

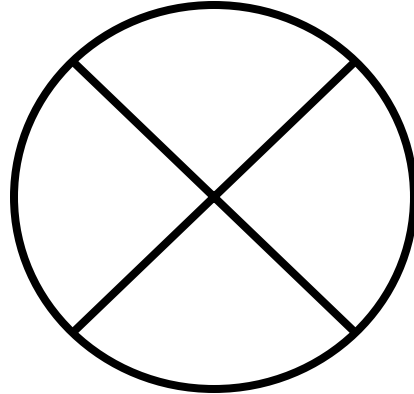
**Cultural**

 *Medicine Wheel* ... based on layered pattern:

natural



ideal




abstract



**PATTERN**

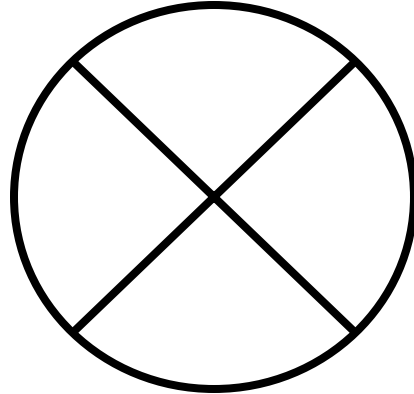
**Cultural**

 *Medicine Wheel* ... based on layered pattern:

natural



ideal




abstract



**PATTERN**

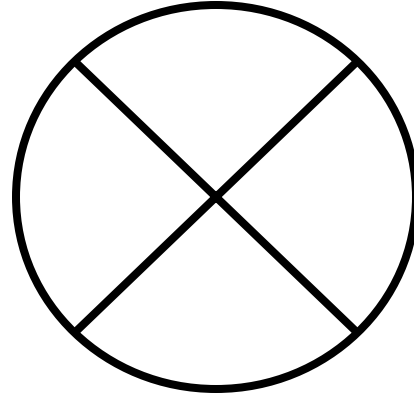
**Cultural**

 *Medicine Wheel* ... based on layered pattern:

natural



ideal




abstract



**PATTERN**

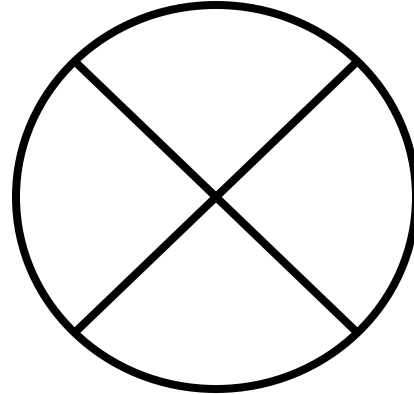
**Cultural**

 *Medicine Wheel* ... based on layered pattern:

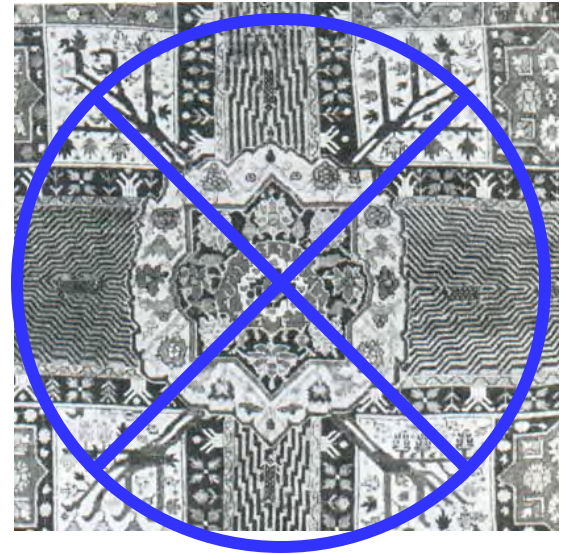
natural



ideal




abstract



**PATTERN**

**Cultural**

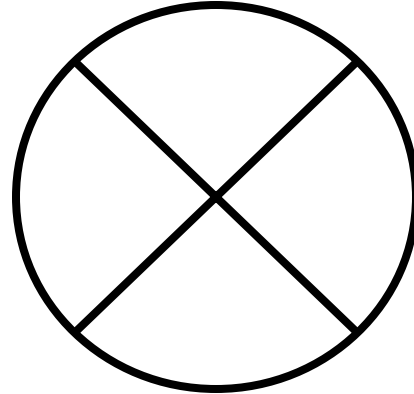


 *Medicine Wheel* ... based on layered pattern:

natural



ideal



abstract

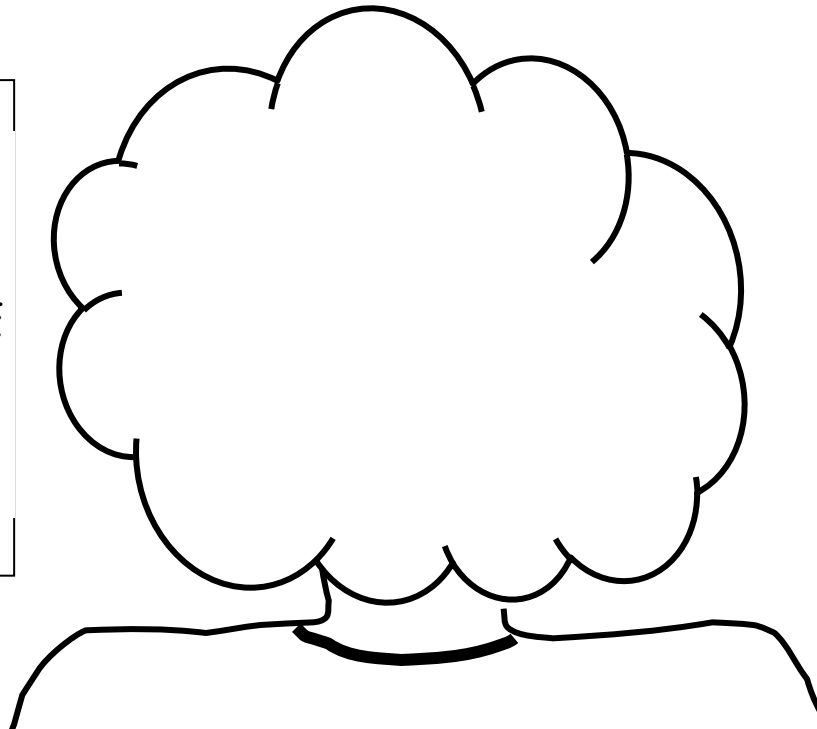
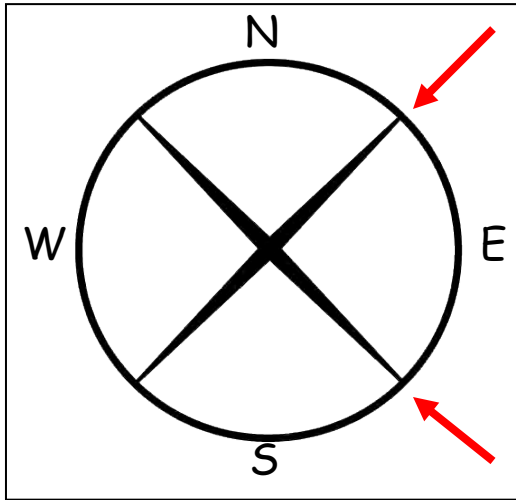
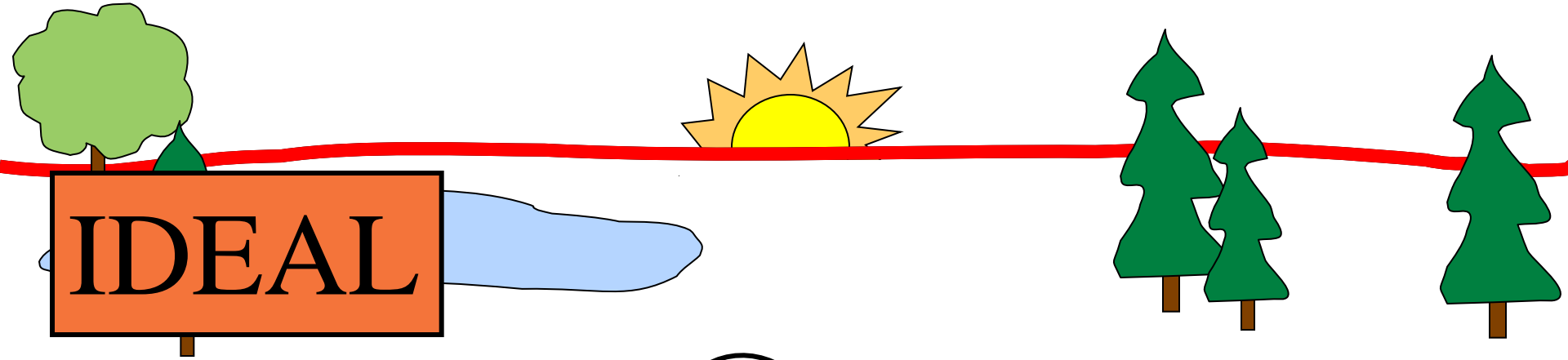


**PATTERN**

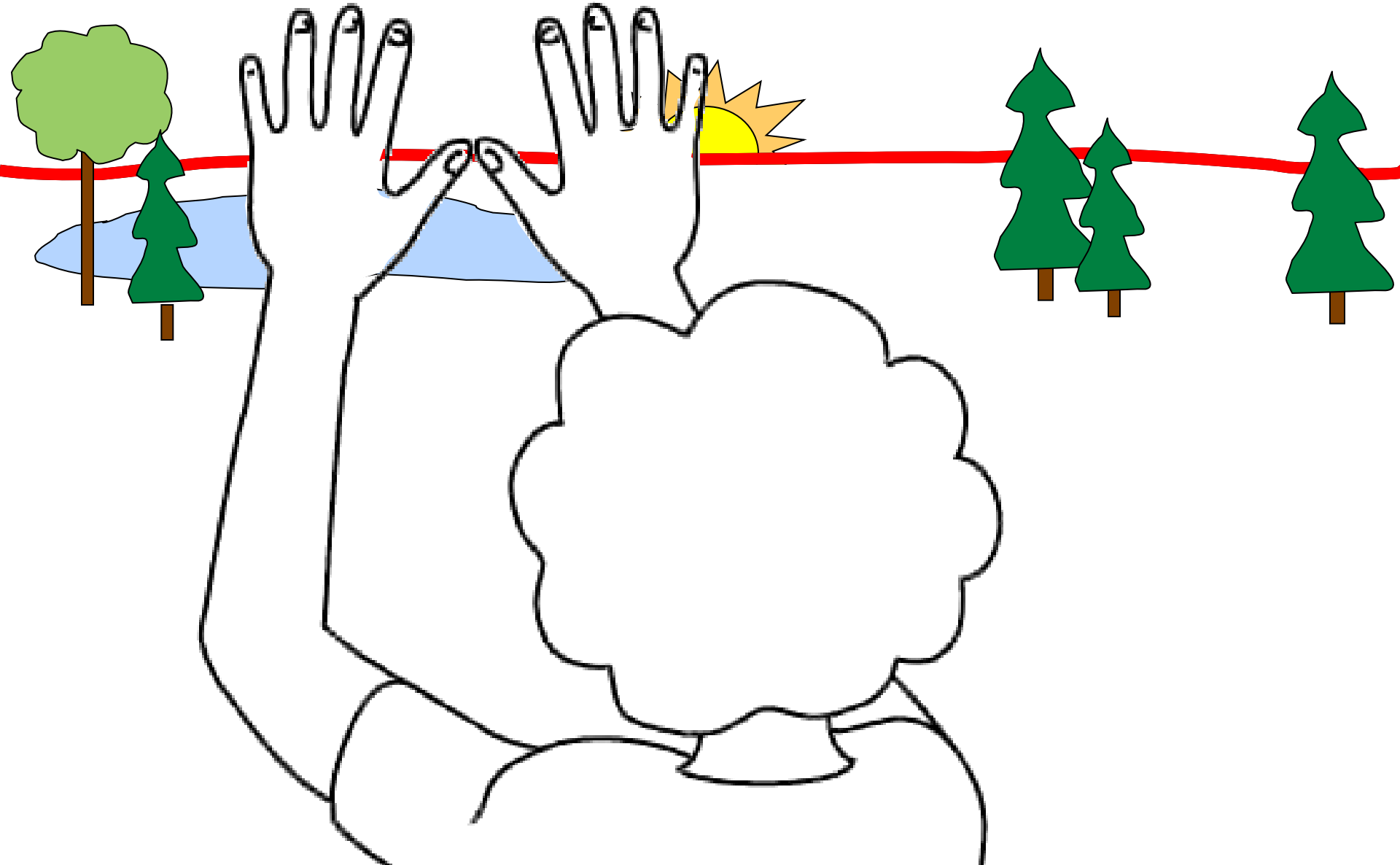
**Cultural**

# E

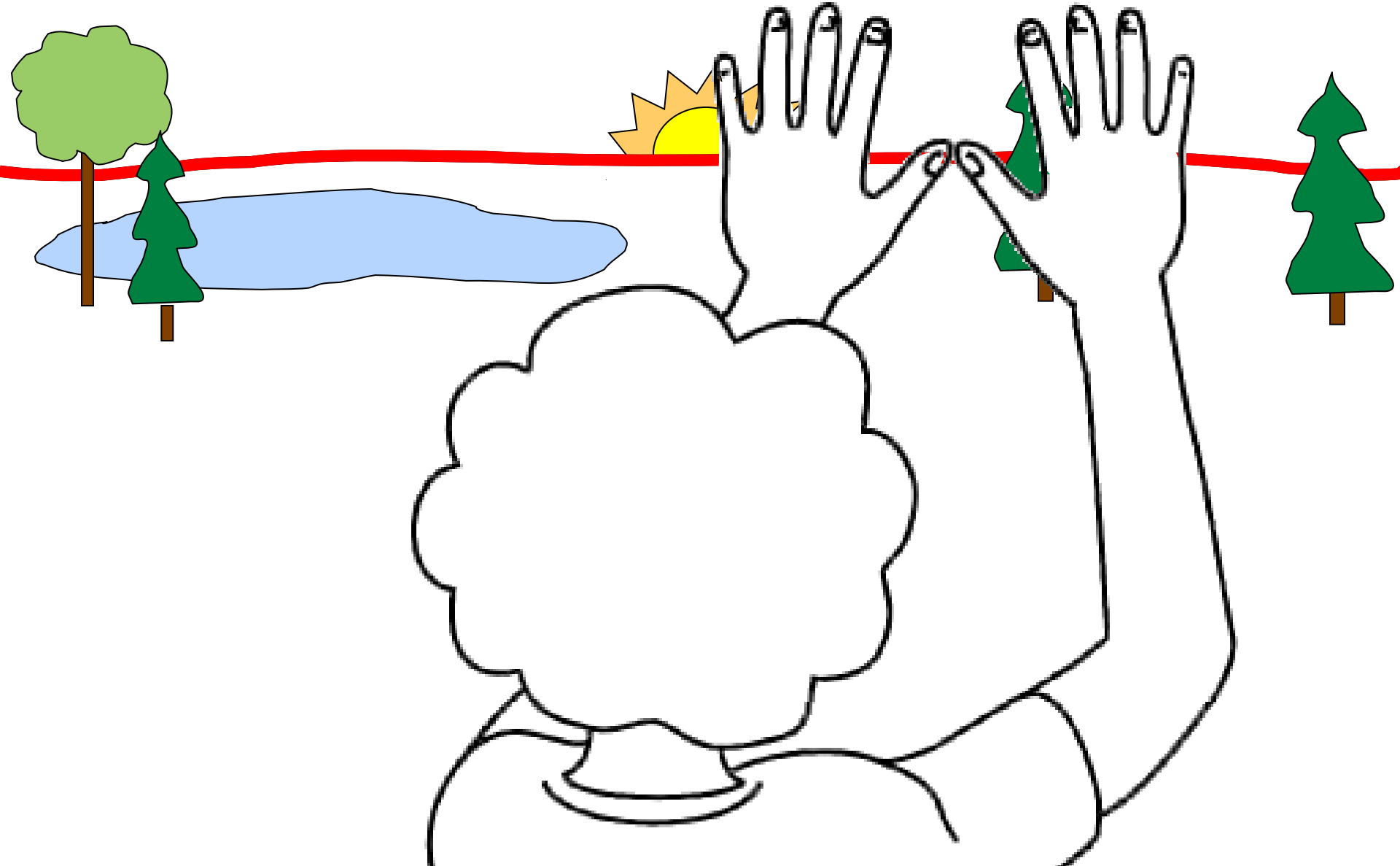
How far does the Sun move along the horizon?



E



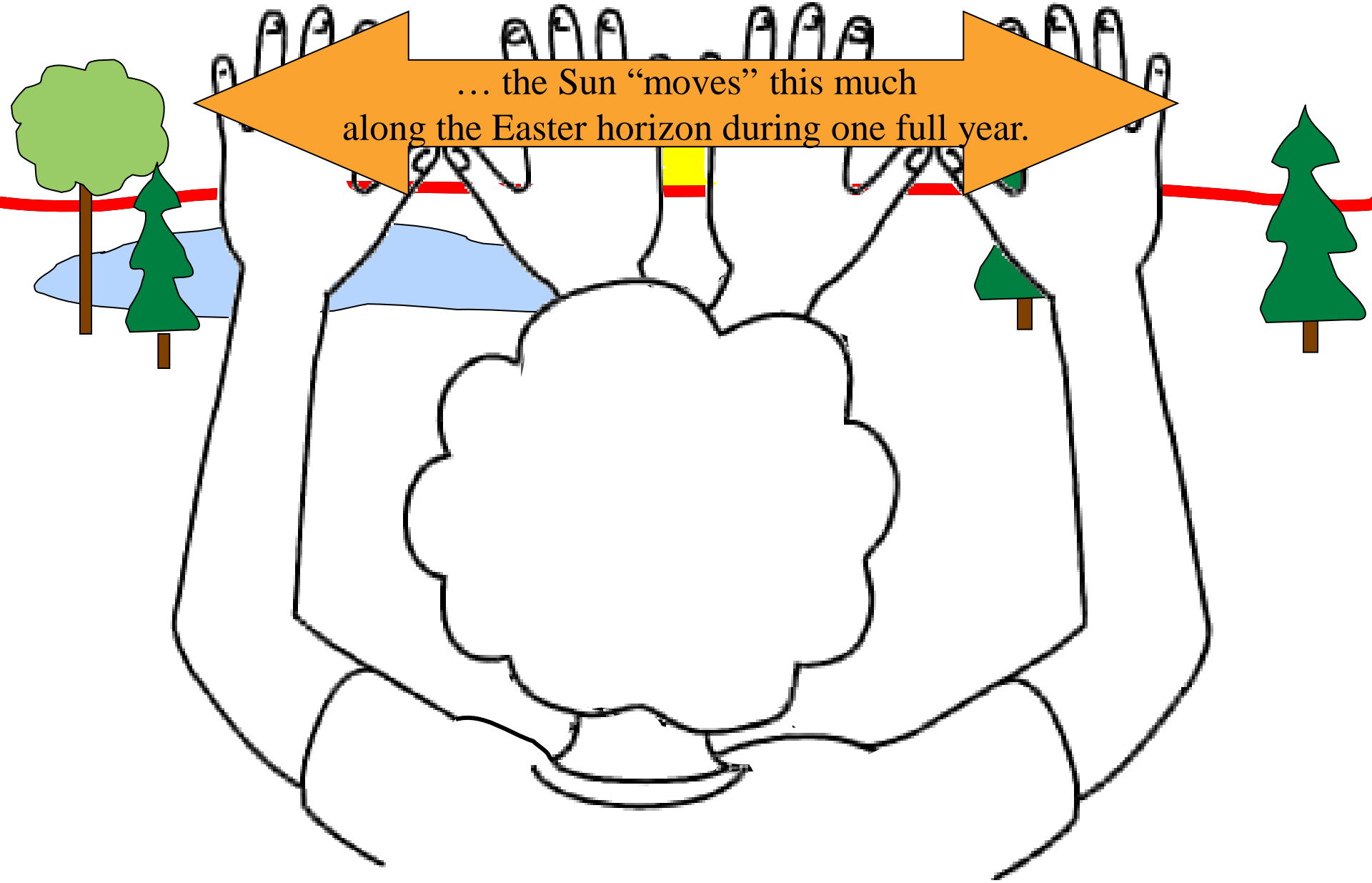
E



In Cape Breton, at 46°N ...

E

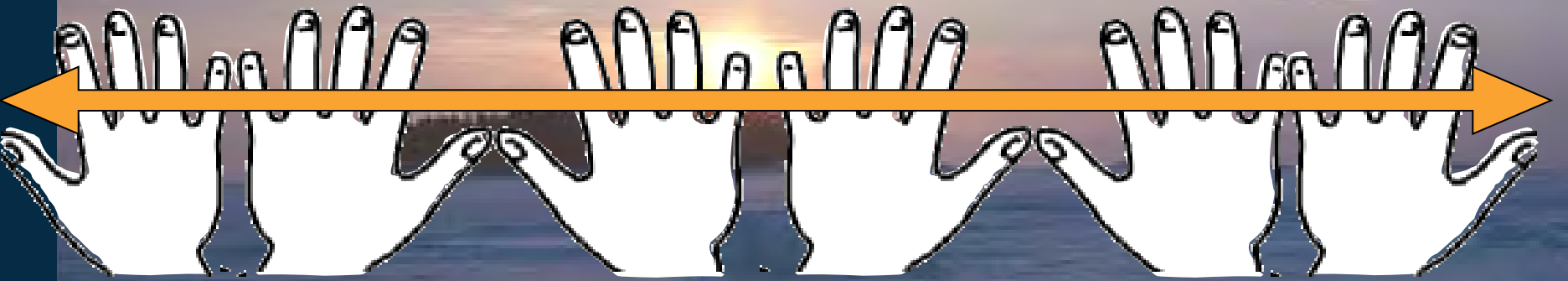
... the Sun “moves” this much  
along the Easter horizon during one full year.



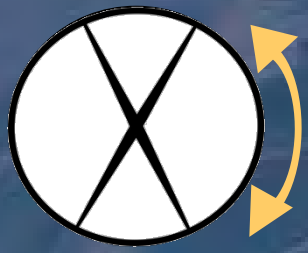


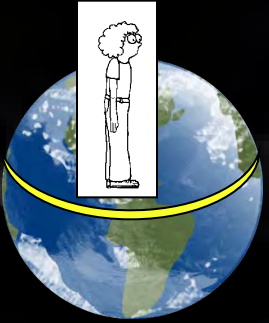
Unama'ki  
(Cape Breton)  
46°N



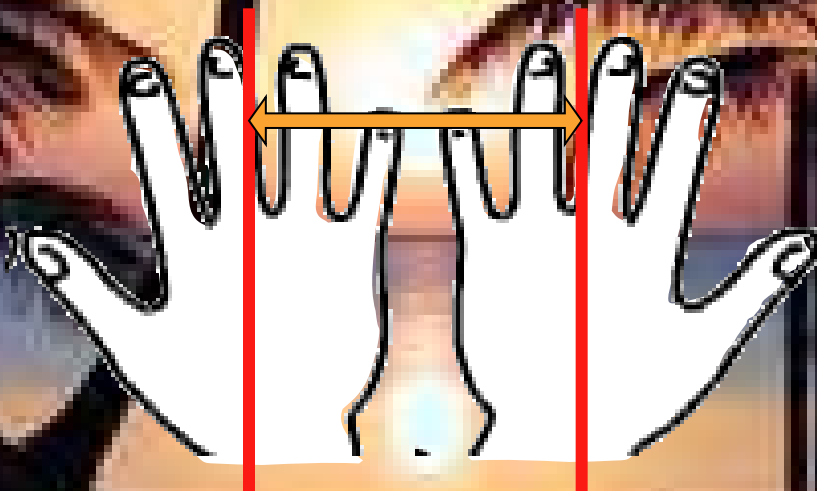


much further  
to the North  
than Unama'ki



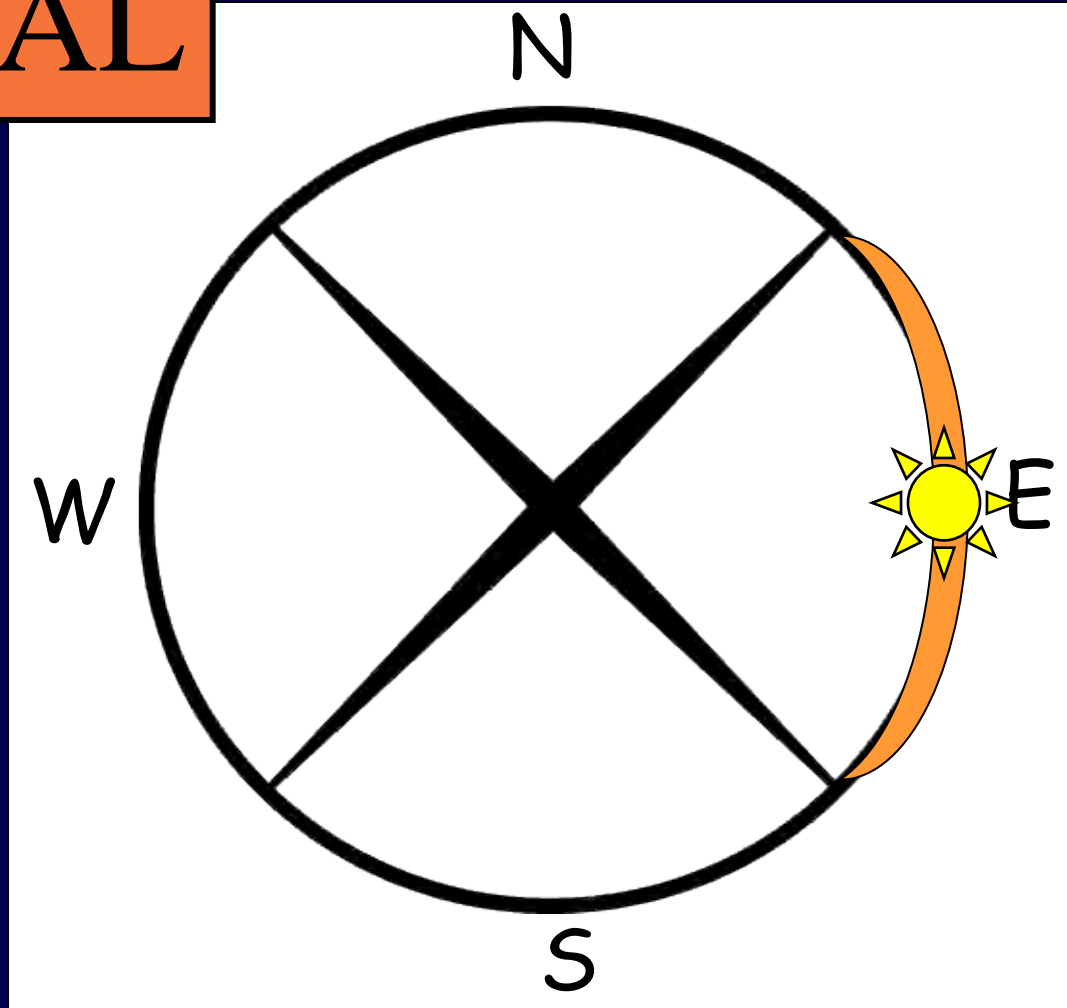


much further  
to the South  
than Unama'ki



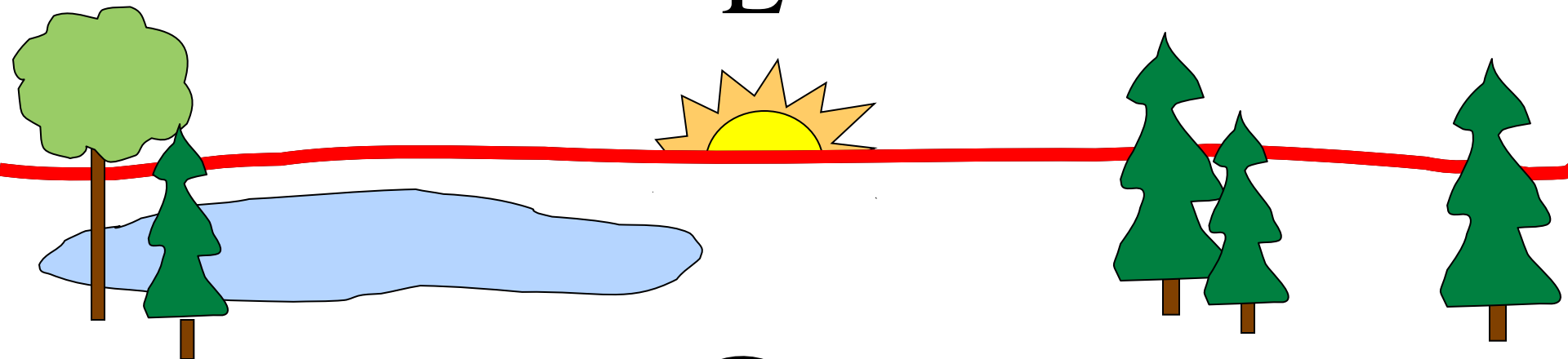


IDEAL

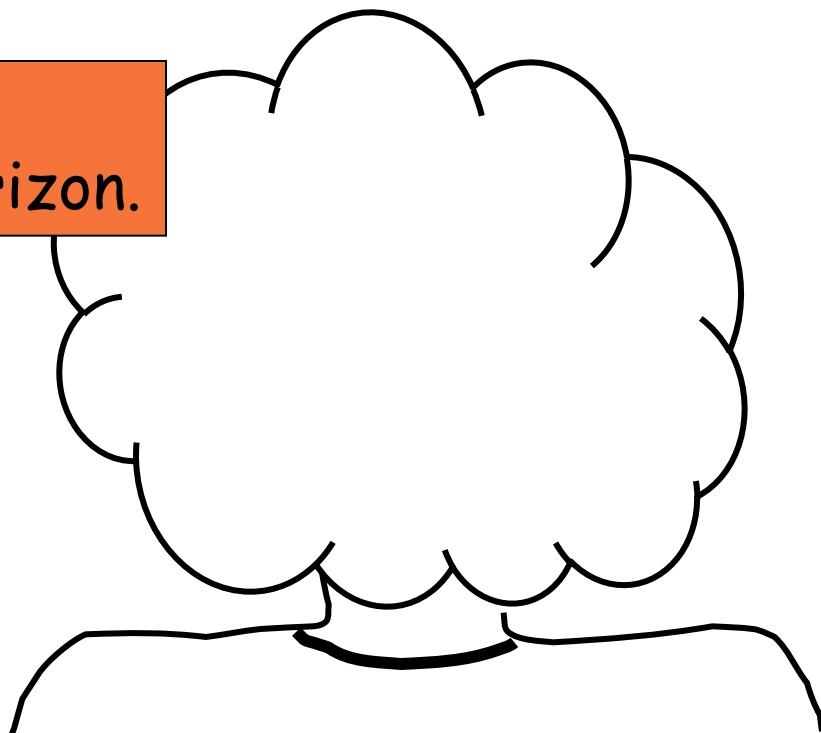


# Lab Exercise

E



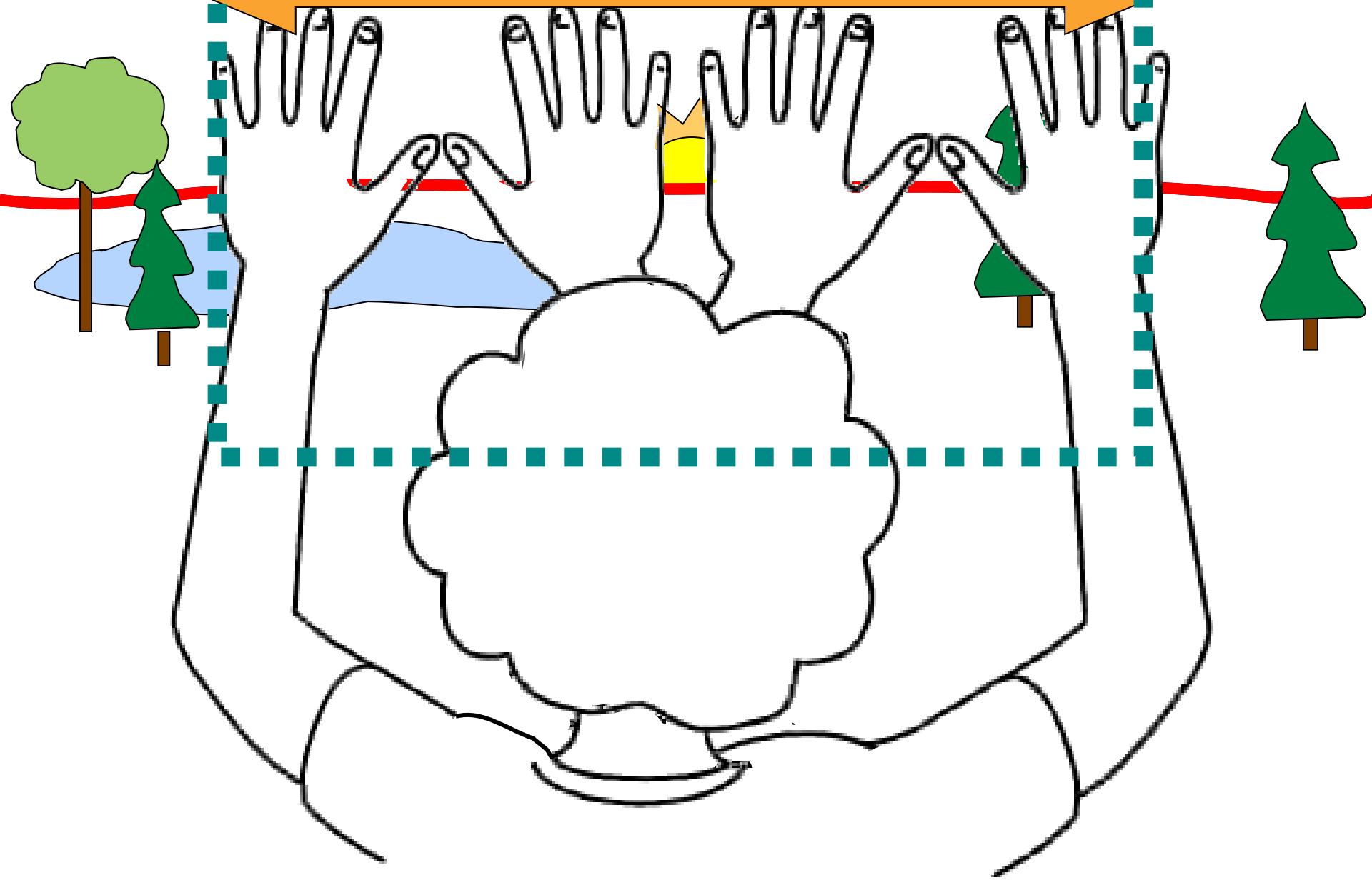
Find East.  
Look at the horizon.



Draw this much of the horizon



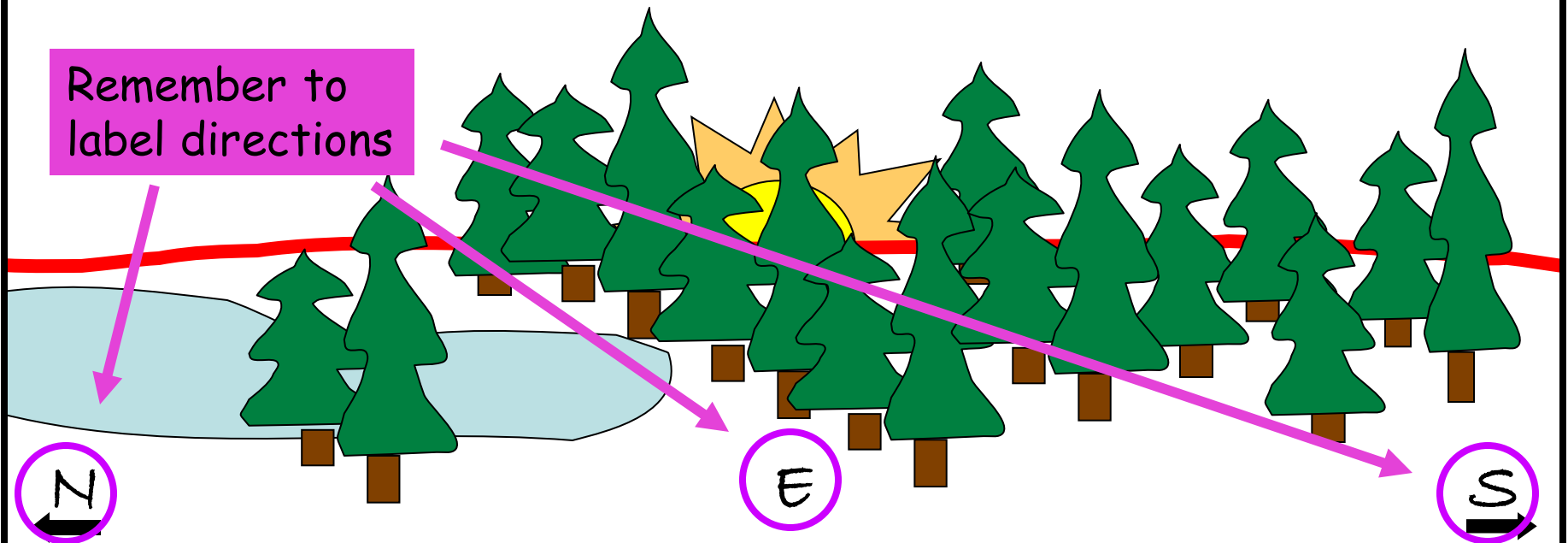
Draw this much of the horizon



## NATURAL – Fall Equinox

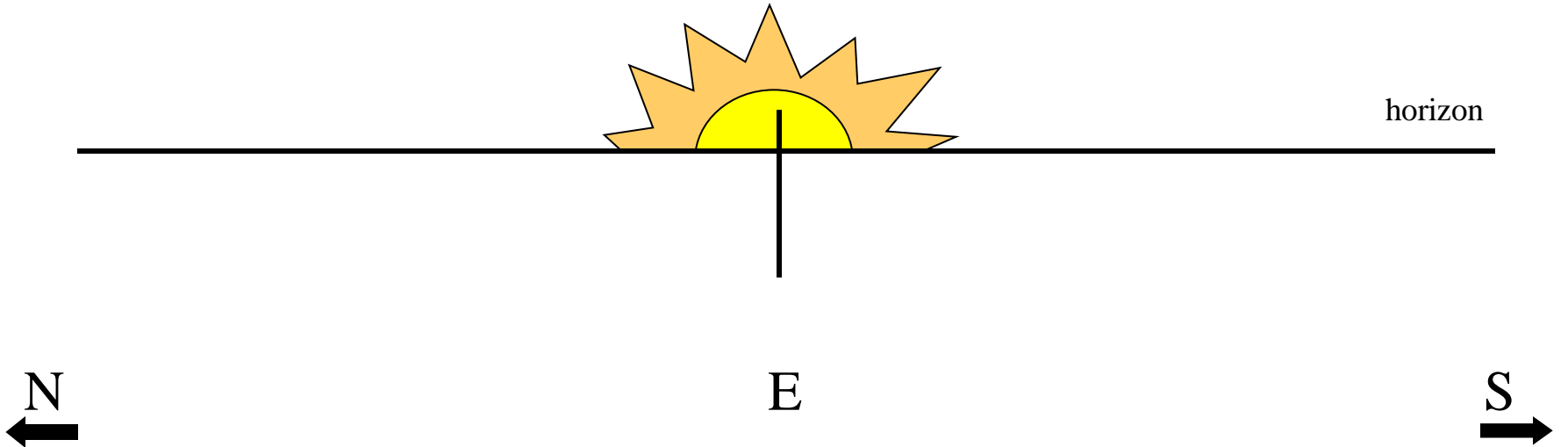
Draw the horizon and the position of the rising sun. Label the directions on the horizon.

Draw all landmarks on the horizon



# IDEAL – Fall Equinox

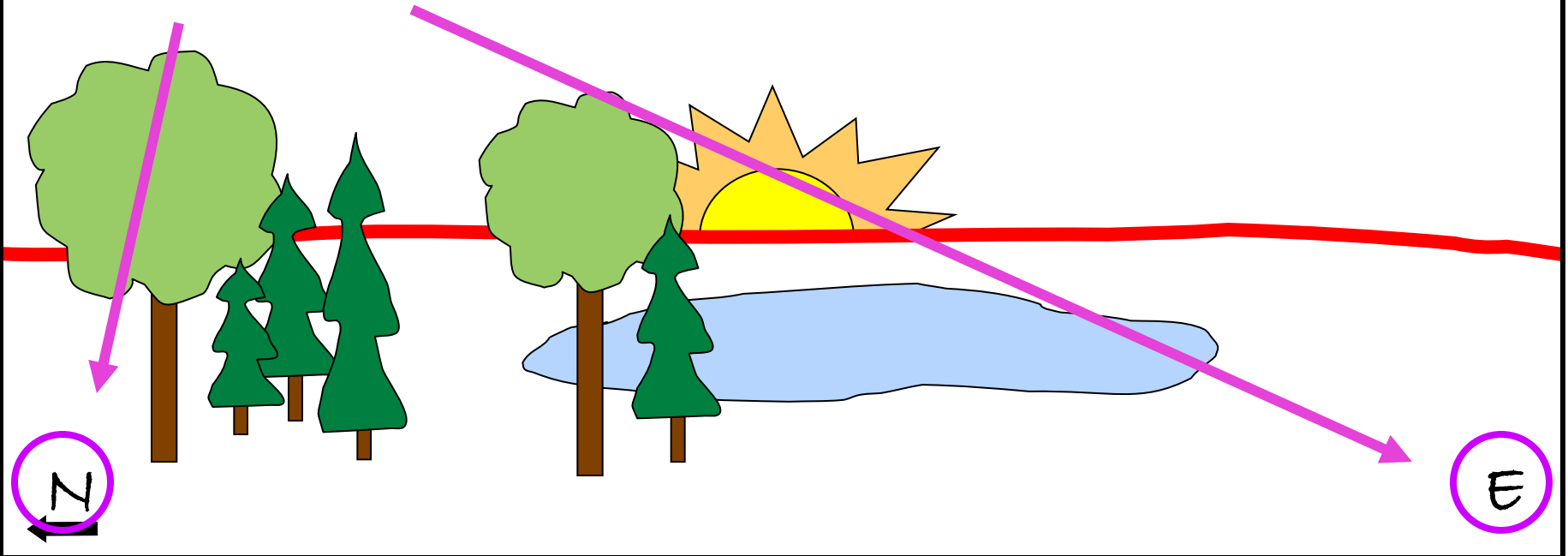
Draw the horizon and the position of the rising sun.



# NATURAL – Summer Solstice

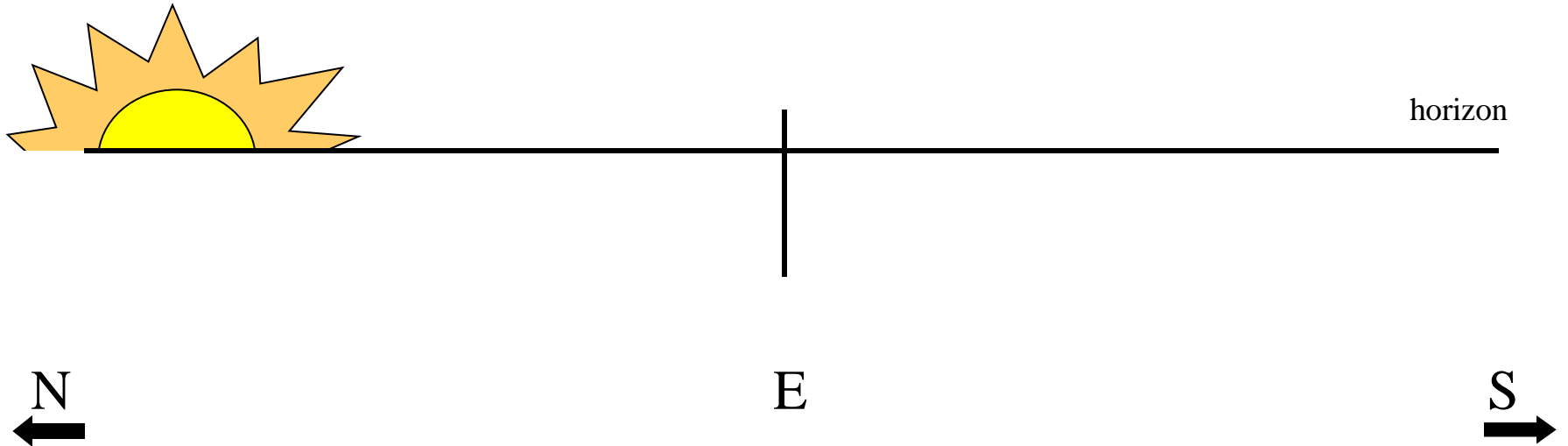
Draw the horizon and the position of the rising sun. Label the directions on the horizon

Remember to label directions



# IDEAL –Summer Solstice

Draw the horizon and the position of the rising sun





# "Natural Horizons" for Sense of Place, Emergence, and Participation



Thank  
you

