# Oklahoma Weather

Brought to you by:

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Adaptable for

Earth Science Classes

Earth Science Weather Unit – 9th-12th Grade

Resources

News 9 Weather – http://www.news9.com/weather

National Geographic TV - https://www.youtube.com/watch?v=PJI1v3PazDY

The Week - http://theweek.com/articles/464148/why-tornado-alley-prone-disaster

Unit Overview and Goal of Unit

To provide students with information about weather, weather safety, weather predicting, and historic weather events.

Thank you so much for downloading News 9's weather unit! In this unit you will find a lesson plan outline as well as worksheets, vocabulary cards, and posters to post in your room. Feel free to use what you want and adapt it for your needs.

Earth Science Weather Lesson Outline:

I. Introduction
   a) KWL Chart (included in unit)
      i) K – Have students write what they know about weather specifically addressing the following:
         (1) Weather - the condition of the atmosphere over a short period of time
         (2) Climate - the behavior of the atmosphere over long periods of time
         (3) Meteorology - science that deals with atmosphere, weather, and weather forecasting
         (4) Forces of Nature
         (5) Safety in Severe Weather
         (6) Weather Mapping Symbols
         (7) Tornado Alley
         (8) Weather Safe Structures
      ii) W – Have students write what they know about weather
      iii) L – At the end of the unit or lesson have students go back and fill in what they have learned about weather.

II. Weather Mapping and Predicting
   a) Text Resources
      i) Pocket Guide to Weather Forecasting by Ron Cordes
      ii) The Kids' Book of Weather Forecasting by Mark Breen & Kathleen Friestad
      iii) Meteorology: The Study of Weather by Christine Taylor-Butler

iv) Guide to Weather Forecasting: All the Information You'll Need to Make Your Own Weather Forecast by Storm Dunlop
v) News 9 Weather http://www.news9.com /weather
vi) Weather WizKids http://www.weatherwizkids.com/weather-words.htm

b) Symbols/Definitions
i) Low Pressure - A whirling mass of warm, moist air that generally brings stormy weather with strong winds. When viewed from above, winds spiral into a low-pressure center in a counterclockwise rotation in the Northern Hemisphere.
ii) High Pressure – – A whirling mass of cool, dry air that generally brings fair weather and light winds. When viewed from above, winds spiral out of a high-pressure center in a clockwise rotation in the Northern Hemisphere. These bring sunny skies.
iii) Stationary Front - A boundary between two air masses that more or less doesn't move, but some stationary fronts can wobble back and forth for several hundred miles a day.
iv) Cold Front – A boundary between two air masses, one cold and the other warm, moving so that the colder air replaces the warmer air.
v) Warm Front – The boundary between two air masses, one cool and the other warm, moving so that the warmer air replaces the cooler air.
vi) Precipitation
(1) Rain
(2) Snow
(3) Sleet – ice pellets often mixed with rain or snow
(4) Hail – pellets of frozen rain that fall in showers from cumulonimbus clouds
vii) Fujita Scale - The scale that measures the strength of tornadoes based upon wind speed.
(1) F0: winds 40-72 m.p.h. - (Light damage) Branches broken off trees
(2) F1: winds 73-112 m.p.h. - (Moderate damage) Trees snapped and mobile home pushed off foundations
(3) F2: winds 113-157 m.p.h. - (Considerable damage) Mobile homes demolished and trees uprooted
(4) F3: winds 158-206 m.p.h. - (Severe damage) Trains overturned and cars lifted off the ground
(5) F4: winds 207-260 m.p.h. - (Devastating damage) Houses leveled and cars thrown some distance
(6) F5: winds 261-318 m.p.h. - (Incredible damage) Houses lifted and thrown some distance

c) Weather Predicting
i) Watch the video provided by National Geographic's YouTube Channel:

https://www.youtube.com/watch?v=PJI1v3PazDY

ii) Discuss the importance and science behind predicting weather following the video

III. Oklahoma Climate – Tornado Alley

a) Text Resources

i) What Stands in a Storm: Three Days in the Worst Superstorm to Hit the South's Tornado Alley by Kim Cross

ii) Tornado Alley by Howard B. Bluestein

iii) Why Tornado Alley is Prone to Disaster found at http://theweek.com/articles/464148/why-tornado-alley-prone-disaster

b) Examine maps of Tornado Alley

c) Discuss what elements are present which make Tornado Alley so tornado prone

i) Flat land

ii) Meeting point of moist tropical air from the Gulf of Mexico and cold dry air from Canada

iii) Powerful rotating updrafts and downdrafts create supercells (severe storms) that can produce tornadoes

d) Activity

i) Have students observe the various maps of tornado alley

ii) Have students in partners or small groups create a salt dough* map of the United States illustrating tornado alley

*recipe below

IV. Catastrophic Weather Events in OK History

a) Text Resources

i) What Stands in a Storm: Three Days in the Worst Superstorm to Hit the South's Tornado Alley by Kim Cross

ii) 2013 Oklahoma City Tornadoes by Stephanie Watson

iii) Oklahoma's Devastating May 2013 Tornado by Miriam Aronin

iv) The 8 Most Horrifying Disasters that Ever Happened in Oklahoma http://www.onlyinyourstate.com/oklahoma/disasters-in-ok/

b) Dustbowl

i) http://www.okhistory.org/publications/enc/entry.php?entry=DU012&I=

c) Tornadoes

d) Flooding

e) Ice/Snow/Blizzards

i) https://www.facebook.com/okhistory/photos/a.156238804537018.1073741830.152559718238260/252577541569810/?type=3&theater

f) Have students visit NOAA's Significant Weather Events site for Oklahoma http://www.srh.noaa.gov/oun/?n=events

i) Assign small groups a set of years or weather types
ii) Each group is responsible for researching their assigned time/weather
iii) Each group creates and shares with the class a presentation discussing the important elements of their research
(1) Time
(2) Location
(3) Event
(4) Severity of destruction/death toll

V. Weather Safe Structures

a) Text Resources
i) Shipping Crate Storm Shelter http://ecoble.com/2009/03/27/recycled-buildings-awesomely-creative-reuse-projects/
ii) Flooding safety https://www.ready.gov/floods
iii) Tornado safety https://www.ready.gov/tornadoes
iv) Winter weather safety https://www.ready.gov/winter-weather
v) Sheltering Your Family http://www.wellsmade.net/sheltering-your-family-from-tornadoes/
vi) FlatSafe Tornado Shelters http://www.flatsafe.com/

b) Activity: Ask students to bring 10-15 pieces of clean "trash" to school (empty cardboard boxes, cereal boxes, baggies, bottles, jars, foil, straws, egg cartons, etc.)

c) Have students pile all of their trash together with glue, tape, scissors, etc. provided by teacher

d) Using the available trash and supplies students must design and create a weather safe structure that will withstand storms, flooding, tornadoes, ice, extreme heat, etc.

e) Students will present their creation and share their reasoning behind the design of their weather safe structure to the class

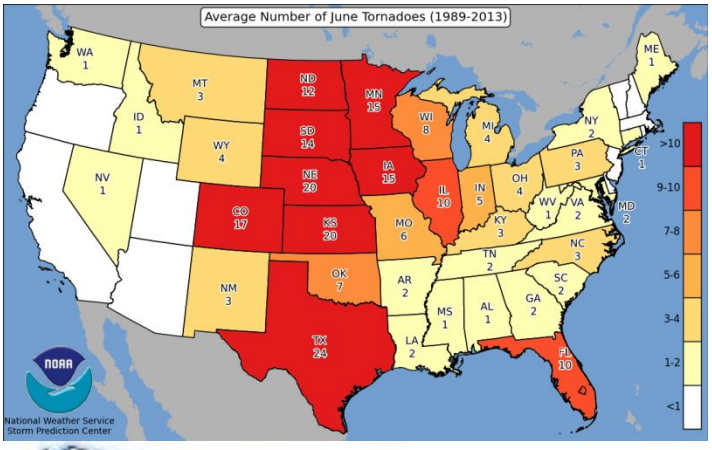
VI. Closing

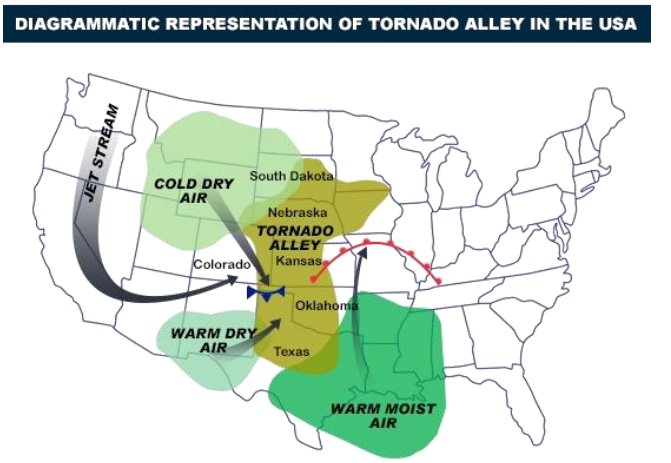
a) Go back and fill out the "What I Learned" section of the KWL chart

b) Have students share and defend their created weather safe structures discussing their design and use. Rubric provided below.

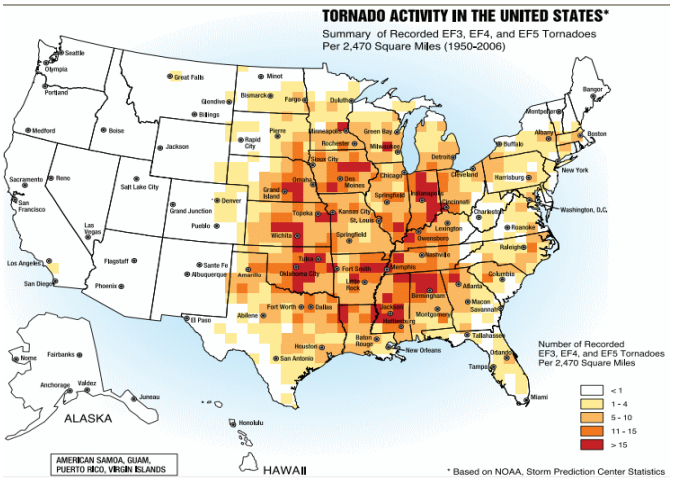
| K | W | L |
| --- | --- | --- |
| What do you already KNOW about weather? | What do you WANT to know about weather? | What did you LEARN about weather? |
| | | |

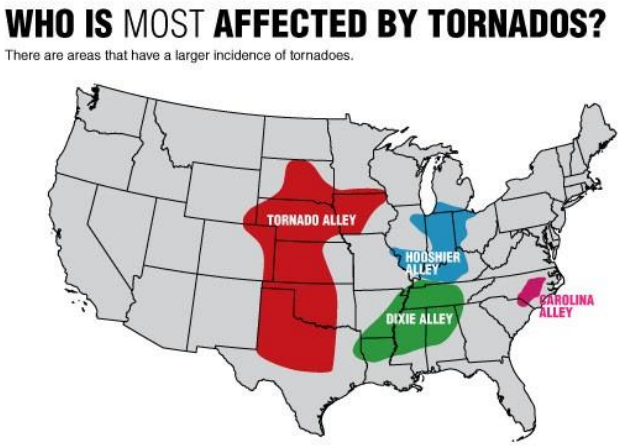
# MAPS OF TORNADO ALLEY

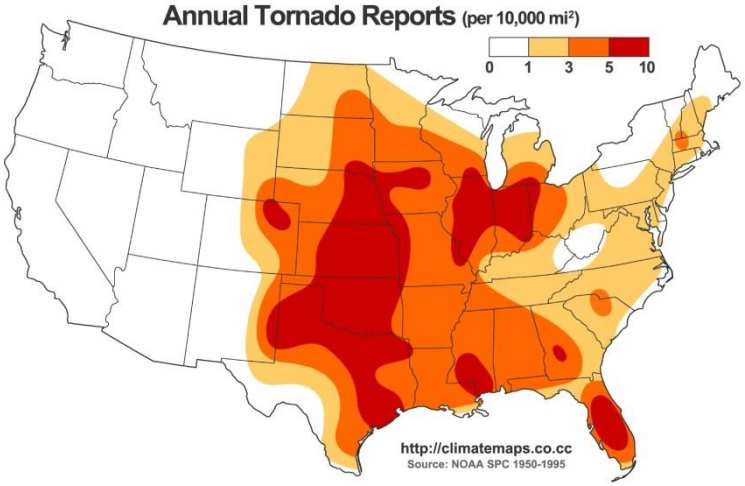


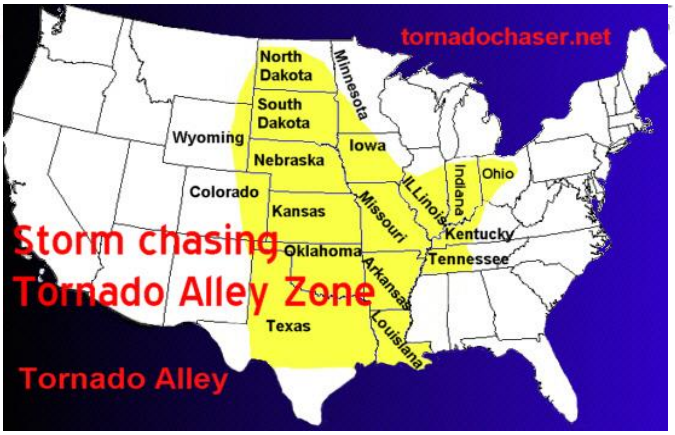







# SALT DOUGH RECIPE

## Materials Needed per Recipe

-4 cups flour
-2 cups salt
-2 cups water
-2 tablespoons cream of tartar
-large bowl
-large piece of cardboard (to make map on)
-marker (to trace USA onto cardboard)
-paint
-paint brushes

## Procedures

-In large bowl combine flour, salt, water, and cream of tartar
-Stir with hands till dough forms
-On cardboard trace outline of USA
-Using dough press a 3-dimensional model of the US onto the cardboard paying specific attention to the tornado alley area and major mountain ranges
-Allow dough to dry (1-2 days depending on humidity)
-Paint dough illustrating mountain ranges and traditional tornado alley path

## Discussion

-Invite students to discuss their models looking at why, based on the topography of the United States, tornado alley is placed where it is

# WEATHER SAFE STRUCTURES GRADING RUBRIC

| | 5 points | 4 points | 3 points | 2 points | 1 point | 0 points |
|---|---|---|---|---|---|---|
| Student(s) used a variety of "trash" items | 8-10 trash items used | 6-7 trash items used | 4-5 trash items used | 2-3 trash items used | 1 trash item used | Project incomplete |
| Structure is designed thoughtfully to address survival in tornadoes, floods, winter weather, extreme heat, etc. | All types of weather thoroughly considered and taken into account in design | 3-4 types of weather thoroughly considered and taken into account in design | 3-4 types of weather considered and taken into account in design | 1-2 types of weather thoroughly considered and taken into account in design | 1-2 types of weather considered and taken into account in design | Project incomplete |
| Used 2 or more outside resources in design | 2 or more resources effectively used and discussed in presentation | 2 or more resources used and discussed in presentation | 2 or more resources used OR discussed in presentation | 1 resource effectively used and discussed in presentation | 1 resource used and/or discussed in presentation | Project incomplete |
| Student composed and presented structure in a clear, well-thought-out manner | Presentation well planned and given with thorough explanation of design and reasoning | Presentation planned and given with solid explanation of design and reasoning | Presentation planned and given with explanation of design and reasoning | Presentation planned and given with explanation of design OR reasoning | Presentation given without proper planning or explanation of design and/or reasoning | Project incomplete |

Total Points From Rubric - _____

x 5

Final Grade - _____