ALTERNATIVE LESSON PLANS FOR DISTANCE LEARNING

These alternative lesson plans condense what is taught and suggest ways to support students learning at home.
We acknowledge that every situation is unique and strive to provide plans that can be used online or as printed packets.
Focus on fewer scientific principles. Use print and audio readings. Share the videos that you can. Discuss if you can.

UNIT TITLE	**ES2**
DRIVING QUESTION	What Makes the Weather Change?

Lesson 1 (2 days)	**What Is Weather?**
Activity 1.1	Identifying Weather Conditions around the World
Reading 1	*What Can Clouds Tell Us about Weather?*
Activity 1.2	Setting Up the Driving Question Board (DQB)

Lesson 2 (2 days)	**What Makes Air Hot?**
Activity 2.1	It Is Heating Up
Activity 2.2	A Little Heat from Me to You Student Activity Video: https://iat.wistia.com/medias/33y4ixppmb
Reading 1	Why Does Conduction Matter?

Lesson 3 (3 days)	**What Happens to the Hot Air?**
Activity 3.1	How Do Differences in Temperature Affect Air Masses? Student Activity Videos: https://iat.wistia.com/medias/uvpkmklqvo https://iat.wistia.com/medias/o8f0fdn31l https://iat.wistia.com/medias/qjbf1ri6cq
Activity 3.2	What Happens When Air Is Heated or Cooled? Student Activity Videos: https://iat.wistia.com/medias/oowqeu67pj https://iat.wistia.com/medias/85wjgcbnm7
Activity 3.3	Why Heat Rises Students can create their own models, and possibly share if using video conferencing. The teacher can also share sample models from the TE after students have created their initial models, discuss samples posted, and have students revise their models after discussion.
Reading 1	*Why Learn about Convection?*

Lesson 4 (3 days)	**Where Does the Energy Come from in a Storm?**
Activity 4.1	Constructing a Barometer Students will not create a barometer, however they are able to collect barometric pressure readings from the internet on a daily basis and record. This video allows students to experience the setup and gain understanding of what a barometer measures. https://www.youtube.com/watch?v=wSILpxbZjVk
Activity 4.2	Temperature Difference and Movement of Air Masses Teachers may have students record notes or draw an illustration of what they observed in the demonstration. Student Activity Videos: https://iat.wistia.com/medias/rv0ih5rqno https://iat.wistia.com/medias/ga3yj5xm2f
Activity 4.3	Is a Storm Cloud Different from Other Clouds? Share Projected Images 1) Cirrus Clouds 2) Cumulonimbus Clouds 3) Altocumulus Clouds 4) Fair Weather Cumulus Clouds 5) U.S. Surface Analysis Map Search for storm video as directed in the TE preparation section or use this video https://www.youtube.com/watch?v=LEAYUAy8DcI Have students revise their models from Lesson 3. Teachers might also like to share the sample model from the TE and discuss with students, then allow students to add to their newly revised model as needed.

Lesson 5 (2 days)	**What Can Weather Maps Tell Us?**
Activity 5.1	What Can Weather Maps Tell Us? Share Projected Images: 1) U.S. Surface Analysis Map (3/9/12) 2) U.S. Satellite Map (3/9/12) 3) U.S. Radar Map Share local data for this activity. You would need a national weather map and also a regional one. The source used for the maps in this lesson was http://www.intellicast.com. You can access both national and regional maps at this site for all three types of data used in the discussion: clouds, precipitation, and pressure.
Reading 1	*How Do Scientists Get the Data?*
Activity 5.2	Creating an Isobar Map Share Projected Images 1) Surface Area Map with Pressure Lines 2) Pressure Map 3) Map Overlay Teachers may want to share sample Isobar maps as the basis of their discussion and for students to self- check/correct their own maps.

Lesson 6 (3 days)	**Does the Storm Model Fit Data from a Storm?**

Activity 6.1	Can We Identify Patterns in Data? Share Projected Images: 1) Surface Analysis (6/2/10) 2) Zoomed Regional Map (6/2/10) 3) Chart of Conditions 4) Regional Map after Storm (6/3/10)
Activity 6.2	Can the Storm Model Explain the Data? Share Projected Images: 1) Temperature Data 2) Humidity Data 3) Pressure Data 4) Precipitation Data Post discussion questions for multiple student responses if possible and then summarize responses for group explanation. Students will revise their model from Activity 4.2.
Reading 1	*Is It Going to Snow or Rain or . . .*

Lesson 7 (5 days)	**Why Does Temperature Vary in Different Locations?**
Activity 7.1	How Can We Compare Cities on Earth? Share: PI: Data Table on Temperature. Teachers may need to review Latitude and Longitude with students.
Activity 7.2	Do the Number of Daylight Hours Vary in Different Locations on Earth? Share PI: Data Table on Daylight Hours
Activity 7.3	Does the Earth's Shape Affect Temperature? https://d16dnhlej6sizh.cloudfront.net/assets/portal/Teacher-Portal-Resources/ES2_se_v2_0_5_video-lesson_7-201.mp4 https://iat.wistia.com/medias/wrauzgh1qr
Activity 7.4	Does the Angle that Light Hits the Earth Affect Intensity? Student Activity Video: *https://iat.wistia.com/medias/u3ihi0ihoj*
Activity 7.5	Can We Explain the Pattern in the Data?
Exercise 7.5	Do the Data Match the Explanation?

Lesson 8 (3 days)	**What Else Is Affecting Temperature?**
Activity 8.2	How Does the Earth Move? Student Activity Videos: *https://iat.wistia.com/medias/dm2qs1mge1* *https://iat.wistia.com/medias/50oxgn5u4s*
Reading 1	*Day and Night*
Activity 8.3	Does a Tilted Earth Explain the Seasons? Teacher will need to share the list of scientific principles for students in this activity
Reading 2	*Seasons of the Year*
Activity 8.4	Why Is the Temperature Not the Same Everywhere*?*

SUMMATIVE ASSESSMENT:. By the end of the unit, students should be able to answer with a full, CER explanation based on evidence from their investigations: "Why is weather different from place to place?" and "What makes the weather change?"

You might choose to emphasize only a portion of this as a final assessment, given what you are able to teach and what students are actually able to do during this remotely taught unit.

Appendix	
Lesson 1	Climate Change
Activity 1.1	Global Warming Share Projected Images: 1) Greenhouse Gases 2) Carbon Dioxide Emissions and Atmospheric Carbon Dioxide Concentrations 3) Global Population and Carbon Dioxide Emissions 4) Carbon Dioxide Concentrations and Global Temperature 5) Historic Carbon Dioxide Concentrations
Reading 1	*Greenhouse Gases*
Activity 1.2	Greenhouse Effect