

# Brussels Fellowship Lesson Plan

**Grade Level:** 6<sup>th</sup> grade (I support Special Education sections of 6<sup>th</sup> grade mathematics so these lessons are tailored for the needs of the students).

**Unit Plan: (Title)** Applying Percentages in a Renewable Energy Context

**Lesson Overview:** In this lesson students will apply their understandings of basic percentages to real world situations, using the context of energy production in the European Union.

**Do Now:** Students will engage in a reading about energy consumption in the EU and then fill in a KWL Chart (Know/Wonder/Learn) to consolidate their thinking.

**Stop and Jot/ Turn and Talk:** Students will write down their response to the question and then “Turn and Talk” with their partner. Students can then share out their responses with the class in a “Popcorn Share.”

**Modeling:** Teacher will model calculating percentages with a visual bar model and through the algorithm of multiplying with decimals.

**Hook:** Students will watch the DW video about electricity generation from renewable sources in the EU and then will discuss with their partner.

**Partner Application:** Using the Energy Transition: The Global Energiewende graphic, students will calculate percentages of energy production in the EU. Students can then share their work out under a document camera or verbally describe their process.

**Mini-Poster-**At this point students will delve deeply into one word problem, solve using two strategies and explain their work fully. This will give teachers an opportunity to assess student learning prior to the exit ticket at the close of the lesson series.

**Exit Ticket:** Students will demonstrate mastery of information via an exit ticket

**\*Opportunity for extension\***

Students can research and compare renewable energy consumption in the US and the EU. Knowledge can be displayed by creating a poster or power point presentation.

**Outcomes for Student Learning:** Students will be able to fluently compute problems with percentages that include decimals.

**EU-related Learning Goals:** Students will explore elements of the EU’s commitment to the climate and the policy levers used to impact behavior.

**Explain - Identify Possible Solutions:**

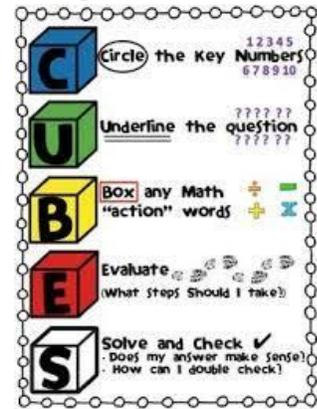
Students should be accurately calculating the computations involving percentages with decimals. There should not be multiple solutions to those calculations, however students may have a range of answers to questions that are opinion or summary based.

### Career Connection Exploration:

Students will be exposed to careers in renewable energy. If this is an area of interest to students, teachers may provide additional information/lessons on those careers.

### Modifications for Differentiation:

This lesson is heavily scaffolded to allow for appropriate access for students with disabilities. As a Special Education teacher, all of my classes are inclusion and require extensive accommodation in order for all students to be able to access the material. As many of my students have reading disabilities, I will read aloud the articles and turn on sub-titles during the video. I will also create anchor charts during the modeling portion of the lessons, so student have constant access to exemplars. Strategies such as the CUBES annotation strategy, Turn and Talks, Stop and Jots and Know Wonder Learn Charts are used throughout the lesson to provide further scaffolding.



Name \_\_\_\_\_

Date- \_\_\_\_\_

**Do Now: Read and annotate using the CUBES strategy**

## The EU's response to climate change: goals and legislation

### At least 55% fewer greenhouse gas emissions by 2030

The EU has adopted **ambitious legislation across multiple policy areas** to implement its international commitments on climate change. EU countries have set **binding emission targets** for key sectors of the economy to substantially reduce greenhouse gas emissions.

By 2017, the EU had reduced its emissions by almost 22% compared to 1990, reaching its 2020 emission reduction target **three years ahead of schedule**. In December 2020, in light of the EU's commitment to **increase its climate ambition** in line with the Paris Agreement, EU leaders endorsed a binding EU target for a net domestic reduction of **at least 55%** in greenhouse gas emissions **by 2030 compared to 1990** – a substantial step up from the EU's previous 2030 target of cutting emissions by 40%.

In April 2021, the Council and the Parliament reached a provisional agreement on the **European climate law** which aims to set into law the 2030 emissions reduction target. The agreement was adopted by EU ministers in June 2021.

While this increased climate ambition will require transforming the EU industry, it will also:

- spur **sustainable economic growth**
- create **jobs**
- deliver **health and environmental benefits** for EU citizens
- contribute to the long-term **global competitiveness** of the EU economy by promoting innovation in green technologies

Watch Video: [Here](#)

**KWL Chart: Take 2 minutes to fill in the chart below about what you read above.**

What do you KNOW?	What do you WONDER?	What do you want to LEARN?

**Activating Prior Knowledge**

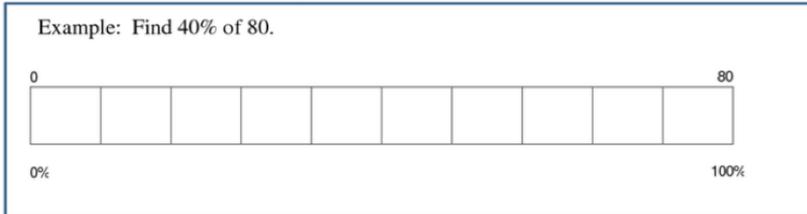
<b>What is 12% as a fraction?</b>	<b>What is 12% as a decimal in simplest form?</b>
<b>What is 12.1% as a fraction?</b>	<b>What is 12.1% as a decimal in simplest form?</b>

## Guided Practice

Stop and Jot	Turn and Talk
How were percentages important in your Do Now article?	Record your partner's response:

### Model 1- Visual Bar Model

Ms. Smith's solar panels produced 40% of the electricity needed for her home. If she needs 80 KWh (kilowatt hours) of electricity per week, how many KWh were produced by her solar panel?



### Model 2-The algorithm

Find 40% of 80

1. Convert the percent to a decimal
2. Multiply by the decimal

### Model 3- The algorithm with decimals

Find 55.1% of 140

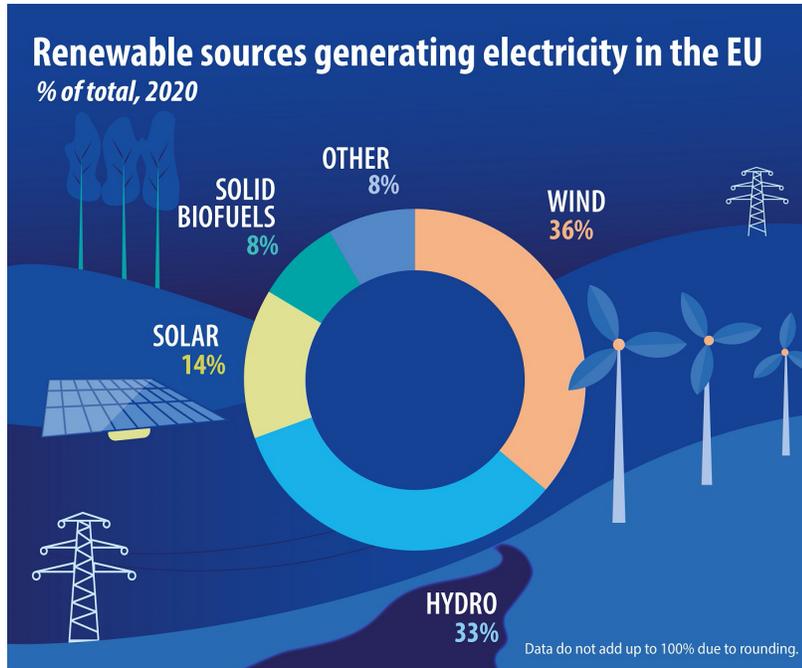
Read, annotate and solve each problem.

What is 65% of 155?	Sarah bought 14.5 gallons of gasoline for her truck. She used 28% of the gas on Friday, how many gallons of gas did she use? <i>Round to the nearest tenth.</i>
Jaquan hopes to earn \$135.50 before the summer. He is 80.25% of the way to his goal. How much money has he saved? <i>Round to the nearest tenth.</i>	Markel is collecting recycling at the middle school. He has collected 1,200 pounds of aluminum and has recycled 22.7%. how many pounds of aluminum has Markel recycled? <i>Round to the nearest tenth.</i>

**Partner Application:**

Watch the [video](#) and take notes:

Recall the information from the video where we learned about the renewable energy endeavors of the EU. In 2021, the EU consumed 2,770 terawatt hours of electricity. Use this information to answer the questions below.



[ec.europa.eu/eurostat](https://ec.europa.eu/eurostat)

How many TWh of energy were produced from wind power (onshore and offshore)?

\_\_\_\_\_ % of \_\_\_\_\_ is \_\_\_\_\_.

How many TWh of energy were produced from solar power?

\_\_\_\_\_ % of \_\_\_\_\_ is \_\_\_\_\_.

How many TWh of energy were produced from solid biofuels?

\_\_\_\_\_ % of \_\_\_\_\_ is \_\_\_\_\_.

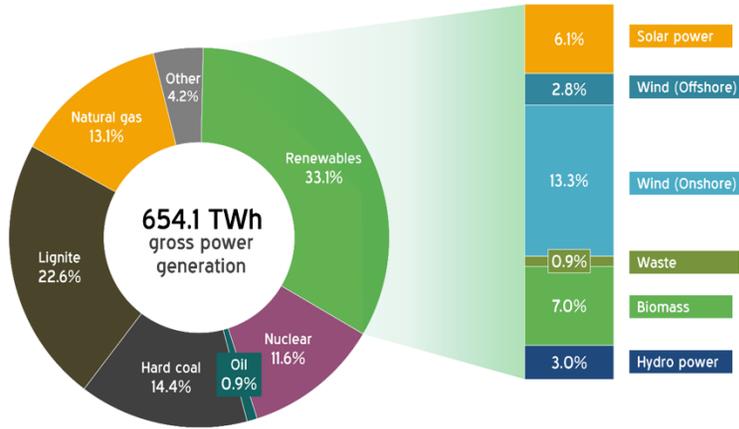
How many TWh of energy were produced from hydro power?

\_\_\_\_\_ % of \_\_\_\_\_ is \_\_\_\_\_.

**Exit Ticket: Show all work**

Germany is a leader in the European Union for supporting renewable energy but is also the largest consumer of energy in the EU, use the graphic to answer the questions below.

Germany reaches 33.1 percent renewable power in 2017  
Gross power generation mix  
Source: AGEB



Energy Transition  
The Global Energiewende  
energytransition.org © by SA

1. Germany generates 13.1% of its power from natural gas. What is this percent as a fraction? Decimal?

Fraction: \_\_\_\_\_ Decimal: \_\_\_\_\_

2. How many TWh of energy were produced from natural gas?

\_\_\_\_\_ % of \_\_\_\_\_ is \_\_\_\_\_.

3. How many TWh of energy were produced from renewable energy in Germany?

Germany produces \_\_\_\_\_ TWh of  
energy from renewable sources.

4. Describe what you learned about renewable energy in the European Union today.

Today, I learned \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

What questions do you still have about calculating percentages?

**Mini Poster-** Working with your partner, you will complete the mini poster rough draft below and then transfer your work to a full size poster for display at Family Night.

<b>Copy Problem and Annotate</b>	<b>Solve Problem using the Bar Model and Decimal Method</b>
<b>List the Steps to Solve</b>	<b>Answer in Complete Sentence</b>

**Mini-Poster Word Problems: Germany is a leader in the EU and is also the largest consumer of energy. We will focus on their energy consumption for the last portion of this mini-unit.**

1. Read and annotate the article linked [here](#), with you partner
2. Select a problem
3. Complete the problem on the mini-poster organizer
4. Get teacher feedback
5. Transfer to the full size poster board

(Cut problems and give one to each person/partner)

<p>According to Coren’s article “In 2018, 40% of the country’s electricity mix came from wind, solar, biomass and hydroelectric sources.” Assuming Germany still produced 654.1 TWh of energy in 2018, how many TWhs came from renewable sources?</p>	<p>In 2017 33.1% of the energy generated in Germany came from renewable sources. Assuming Germany produced 654.1 TWh of energy in 2017, how many TWhs came from renewable sources?</p>
<p>According to Coren’s article “In 2018, 40% of the country’s electricity mix came from wind, solar, biomass and hydroelectric sources.” Assuming Germany still produced 654.1 TWh of energy in 2018, how many TWhs came from renewable sources?</p>	<p>In 2017 33.1% of the energy generated in Germany came from renewable sources. Assuming Germany Assuming produced 654.1 TWh of energy in 2017, how many TWhs came from renewable sources?</p>

## Evaluate - Scoring Rubrics

### Content Standard

4 Advanced	3 Proficient	2 Partially Proficient	1 Beginning
Students are able to calculate percentages with 100% accuracy.	Students are able to calculate percentages with 80% accuracy.	Students are able to calculate percentages with 60% accuracy.	Students are able to calculate percentages with below 60% accuracy.
Students are able to calculate percentages involving decimals with 100% accuracy.	Students are able to calculate percentages involving decimals with 80% accuracy.	Students are able to calculate percentages involving decimals with 60% accuracy.	Students are able to calculate percentages involving decimals with below 60% accuracy.
Students answer responses in complete and well-formed sentences.	Students answer responses in complete and moderately formed sentences.	Students answer responses in complete but poorly formed sentences.	Students answer responses in fragments that are disjointed.