

SPECIAL ED

AIR POLLUTION

FOR HIGH SCHOOL

38
GOOGLE
SLIDES



Special Needs for Special Kids





This unit was created with this guy in mind. He has autism and an intellectual disability. He is a non-reader, and loves the sound of piano keys. With some support he is able to do this unit, and enjoys the challenge. He is my tester!!

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In separate files, you will find:

- Lesson plans
- Voice-recorded PowerPoint
- Directions and links to digital activities

This unit contains almost 200 pages of material. I have included a detailed lesson plan to help you make the most of everything in this unit including how to add some group activities.

Air Pollution and Air Quality Lesson Plan

Preparation

- Print out a vocabulary board for each student to use throughout unit
 - Laminate or place in page protector
- Book
 - Print out, laminate, and bind
 - OR your students can listen to the pre-recorded version
- Vocabulary cards
 - Print out a set of cards onto cardstock and laminate
 - Make one set for each student and one for the teacher to use in I Spy games
- Bingo cards
 - This unit comes with a set of Bingo cards.
 - They are in color and BW!
 - Print on cardstock and laminate.
 - Suggestions for use included in unit.

Preassessment (do day 1 before starting lesson)

- Choose the form of the assessment that best fits the learning level of your students
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

Teaching Tips

1. *Color Coding*: this is a really easy way to add more structure to a matching activity. Outline or color in an empty box or sorting label. Outline or color in the corresponding picture symbols the same colors. Becomes a color matching task.
 - a. For more info, read more here:
<https://specialneedsforspecialkids.org/2015/09/05/using-color-coding-for-differentiation/>
 - b. I also have a blog post on differentiating one activity 3 ways:
<https://specialneedsforspecialkids.org/2018/10/22/differentiating-1-activity-3-ways-easily-and-effectively/>

The lesson plans contain:

Overall tips for teaching
students with significant
needs

Quick Look

| Day | Activity | Day | Activity |
|-----|--|-----|---|
| 1 | <ul style="list-style-type: none">• Book• Vocab cards activity• Circle map | 8 | <ul style="list-style-type: none">• Book• Vocab cards activity• Sorting activity |
| 2 | <ul style="list-style-type: none">• Book• Vocab cards activity• Circle map | 9 | <ul style="list-style-type: none">• Book• Vocab cards activity• Smog simulation |
| 3 | <ul style="list-style-type: none">• Book• Vocab cards activity• Causes collage | 10 | <ul style="list-style-type: none">• Book• Vocab cards activity• Writing prompt |
| 4 | <ul style="list-style-type: none">• Book• Vocab cards activity• Causes collage | 11 | <ul style="list-style-type: none">• Book• Vocabulary cut and paste• Sudoku puzzle |
| 5 | <ul style="list-style-type: none">• Book• Vocab cards activity• Causes collage | 12 | <ul style="list-style-type: none">• Book• Vocabulary cut and paste• Word search |
| 6 | <ul style="list-style-type: none">• Book• Vocab cards activity• Causes collage | 13 | <ul style="list-style-type: none">• Book• Vocab cards activity• Close worksheet |
| 7 | <ul style="list-style-type: none">• Book• Vocab cards activity• Sorting activity | 14 | <ul style="list-style-type: none">• Assessment |

The lesson plans contain:

A quick look at what you will do each day

Day 7

| Activity | Notes | Materials |
|--|--|--|
| Read or listen to a recording of the book (10 minutes) | <ul style="list-style-type: none">• Read through the story, asking lots of questions• Continue to make connections between book and vocabulary board | <ul style="list-style-type: none">• Book• Vocabulary board |
| Vocabulary cards speed game (15 minutes) | <ul style="list-style-type: none">• Place the finished vocabulary cards in the middle of the table• Either hold up or describe a card and the student who can find it first wins and keeps the card<ul style="list-style-type: none">◦ The student with the most cards at the end is the winner | <ul style="list-style-type: none">• Vocabulary cards• Vocabulary board |
| Thinking map review (5 minutes) | <ul style="list-style-type: none">• Review the thinking map completed yesterday | <ul style="list-style-type: none">• Circle map completed yesterday |
| Sorting activity (10 minutes) | <ul style="list-style-type: none">• Students will sort primary vs secondary pollutants affecting our air• Use color-coding if necessary• Make connections to the book | <ul style="list-style-type: none">• Worksheet• Scissors• Glue• |
| Sharing (10 minutes) | <ul style="list-style-type: none">• Each student shares their finished sorting activity with the group using the communication method of their choice | <ul style="list-style-type: none">• Completed activity• Communication devices |

The lesson plans contain:

Detailed instructions on how that day's lesson should run

This unit comes with a vocabulary board.

Vocabulary boards are great for ALL students to assist with participation and engagement in group discussions.

Tips on how to use in the unit!!



The Environmental Protection Agency developed a way for everyone to know how clean or safe the air is on any given day. It is called the **Air Quality Index**.



As you can see, not all pollution is caused by people. Some of it comes from natural sources. The difference is that pollutants that come from nature are normally sporadic and short-lived. People and animals have learned to adapt and deal with natural pollutants.



There is a book with this unit using simple text and photos. It is 38 pages and is an overview of the effects of the human population on the earth.

Both come in pdf versions as well as a voice-recorded powerpoints (so you don't have to print it out.)

air pollution

Air that is dirty and difficult to breathe.



Air quality index

Tells how safe the air is to breathe each day.



pollutants

Solids, liquids and gases that get in the air and make it difficult to breathe.



aerosols

Same as pollutants; solids, liquids and gases that get in the air.



secondary pollutants

Pollutants that combine with the moisture in the air.



ozone

A layer high in the atmosphere protects earth from sun's radiation, dangerous when it builds up close earth.



smog

Forms when smoke and fog combine making it hard to breath.



particulate matter

Small particles that get in the air and can be breathed in, getting trapped in your lungs.

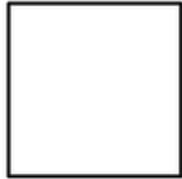


There are 15 vocabulary cards that come in color and black and white.

Included are suggestions for group activities to do with these each day.

air pollution

Air that is dirty and difficult to breathe.



Air quality index

Tells how safe the air is to breathe each day.

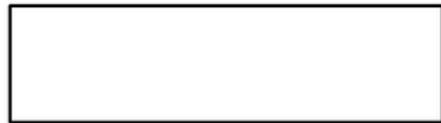


pollutants

Solids, liquids and gases that get in the air and make it difficult to breathe.



primary pollutants



aerosols

Same as pollutants; solids, liquids gases that get in the air.



sulfur dioxide



carbon dioxide



carbon monoxide



Cut apart and match pictures with definition.

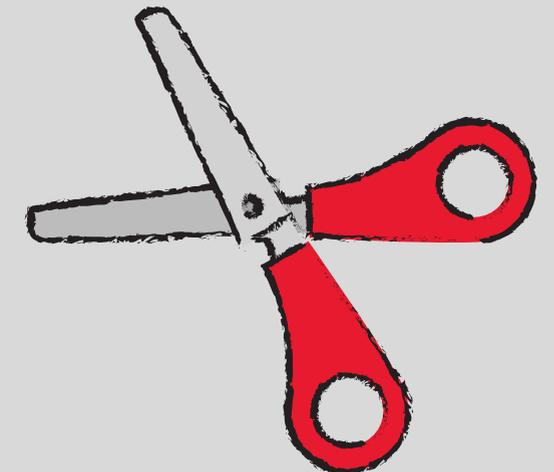
| | | | |
|--|-----------------|--|-----------------|
| | | | SO ₂ |
| | CO ₂ | | |
| | | | |



atch definition with pictures.

| | |
|--|--|
| to the air directly from their natural sources. | Solids, liquids and gases that get in air and make it difficult to breathe. |
| smoke and fog combine to hard to breathe. | A less dangerous gas that is released when oil and coal are burned. Also used by plants and turned back into oxygen. |
| and difficult to breathe. | Pollutants that combine with the moisture in the air. |
| to provide money for research and clean up of air pollution. | Harmful gases that come from vehicles. Modern cars have better engines to minimize these gases. |

On days 11&12 there is an activity where students will match either the picture to the definition or the definition to the picture (harder).



Bingo cards



- Included are 10 Bingo cards in color and 10 Bingo cards in BW.
- Place the cards in page protectors or laminate for long term use.
- This is a great way to practice the new vocabulary included in this unit.
- Cut apart a set of the vocabulary cards to use as the calling cards.
- Options:
 - Show students the picture for them to match
 - Read the definition and see if students can find the matching picture
 - Work as teams
 - Vary the "winning" patterns.
 - Cover all
 - Cover corners
 - Row across or down
 - Cover the edges
 - Vary the ways to mark the card
 - Place in page protector or laminate and use dry erase marker
 - Stickers
 - Post-it notes
 - Dot markers

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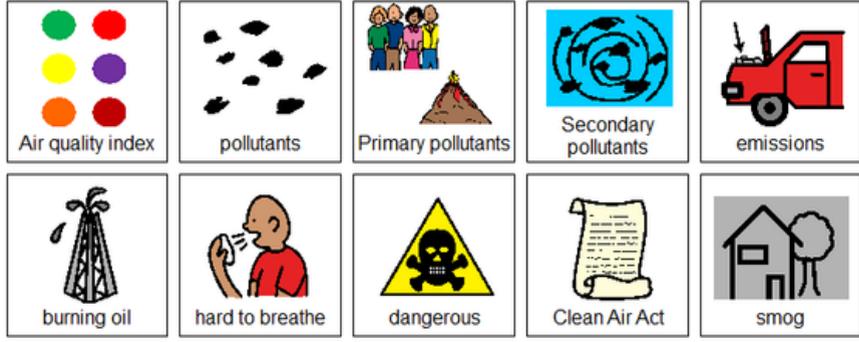
Air Pollution

| | | | |
|-----------------------|--------------------------|-----------------------------------|-----------------------------------|
| CO carbon monoxide | secondary pollutants | acid rain | pollutants |
| dust storm | ozone | primary pollutants | particulate matter |
| Air Quality Index | emissions | Clean Air Act | smog |
| volcanic ash | pollen | SO ₂ sulfur dioxide | CO ₂ carbon dioxide |

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Also included in this unit are 10 BINGO cards (in color and BW) to practice the vocabulary. There are suggestions for various ways to use them.

Place the pictures in the circle map on previous page about air pollution.



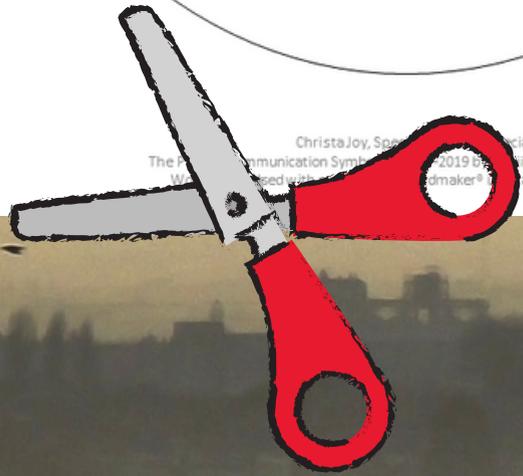
Place the pictures in the circle map on previous page **ONLY IF** you think it relates to air pollution.



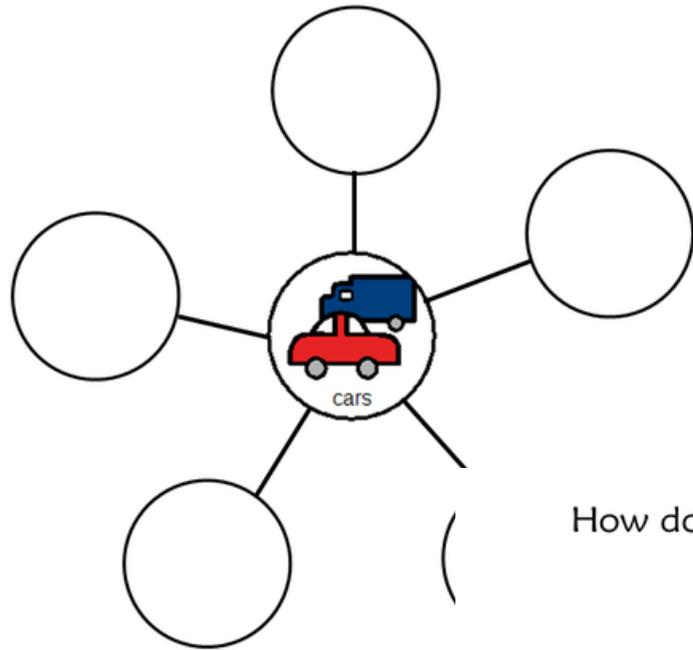
There is are 2 circle maps one on endangered species and one on what you can do.

Circle maps are a great way for students to see the concept at a glance. There are 2 versions:

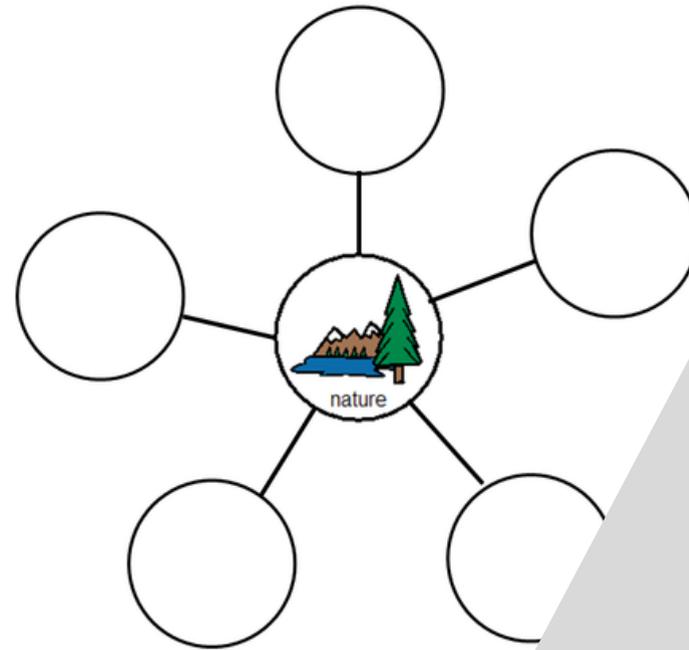
- One is errorless
- One has wrong answers mixed in students will have to set aside



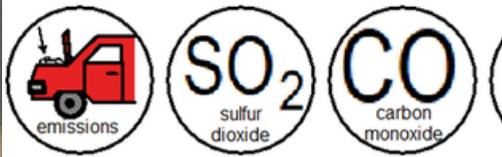
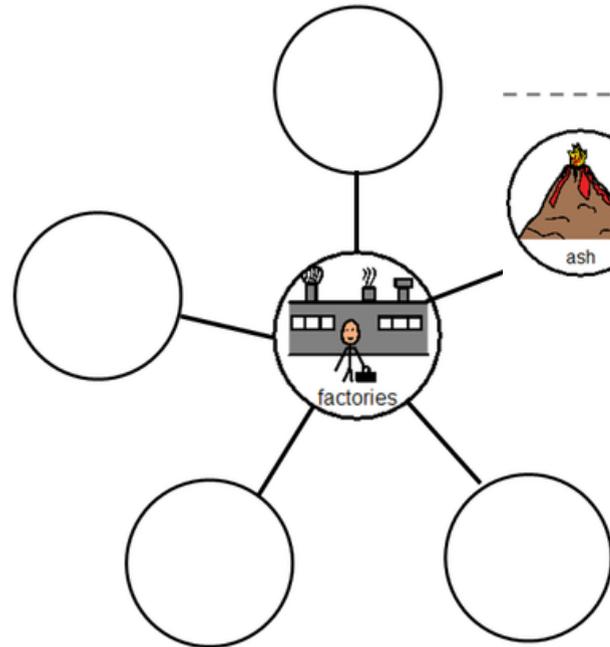
How do cars cause air pollution?



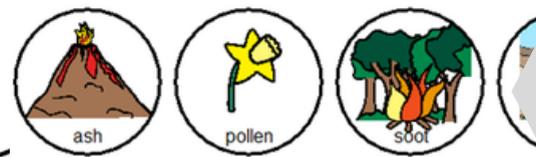
How does nature cause air pollution?



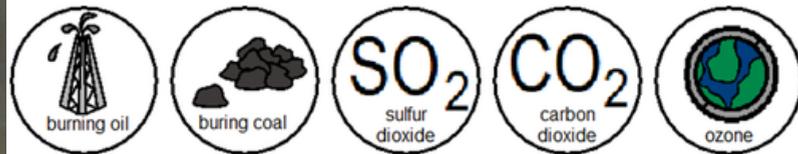
How do factories cause air pollution?



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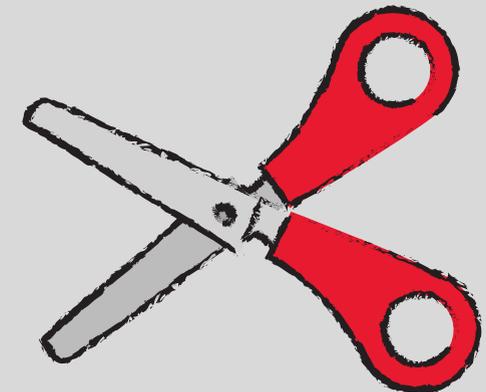


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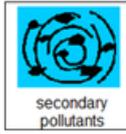
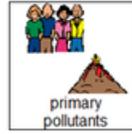


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There are 4 activities that look at the causes of air pollution from different sources. These are errorless activities.



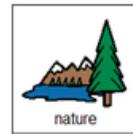
Sort the following into those that are primary or secondary pollutants.



| | | | | |
|-----------------------------------|-----------------------------------|-----------------------|------------------|---------------|
| SO ₂ sulfur dioxide | CO ₂ carbon dioxide | ozone | volcanic ash | smog |
| burning oil | dust storm | factories | burning coal | energy |
| acid rain | acid sleet | CO carbon monoxide | acid snow | emissions |

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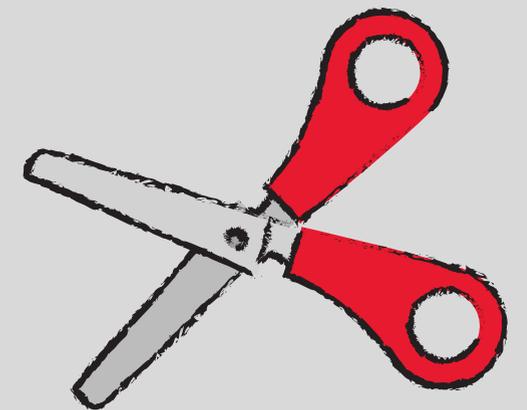
Sort the following into those primary pollutants that come from people and those that come from nature.



| | | | |
|-----------------------------------|------------------|-----------------------|------------------|
| SO ₂ sulfur dioxide | forest fires | smog | volcanic ash |
| burning oil | dust storm | emissions | burning coal |
| acid rain | factories | CO carbon monoxide | aerosols |

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There are also 2 sorting activities. One where students sort primary and secondary pollutants and one that sort primary pollutants from people and from nature.



Making Smog

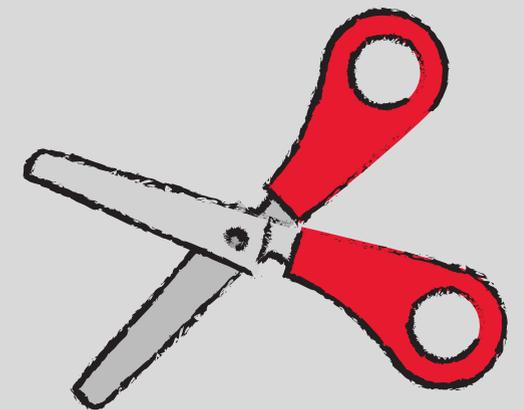
Supplies:

- Glass jar
- Aluminum foil that is shaped to fit over top of glass jar
- Ice
- Paper
- Matches

1. Rinse the jar with water so that the inside is wet. You should not actually have water sitting in the bottom of the jar.
2. Place ice cubes on top of aluminum foil top so that it becomes cold.
3. Light the piece of paper on fire and drop it into the jar.
4. Cover the jar with the foil lid with the ice remaining on top of the lid.
5. The chemicals from the burning paper will combine with the moisture in the jar to create smog.
6. Practice noticing what you can actually see through the smog by placing secret objects behind the jar. Can students see what it is?
7. If you have readers, try writing words on small index cards. Can they read the word through the smog?

NOTE: This was adapted from a video on YouTube. You can watch that demonstration here: <https://youtu.be/RoAjQA6KJSA>

*There is a simulation
that shows you how to
make smog.*



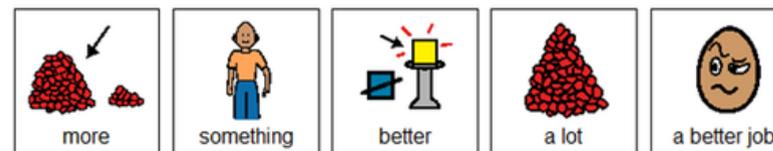
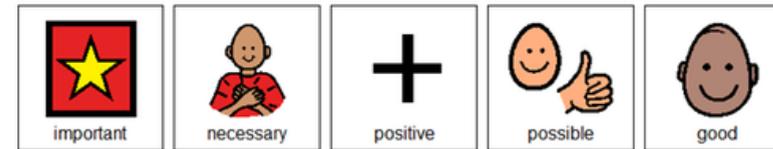
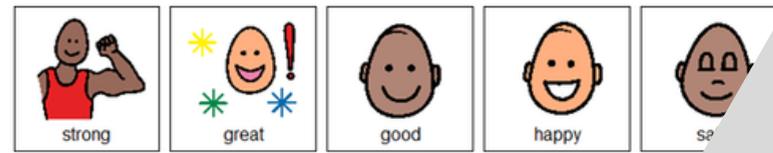
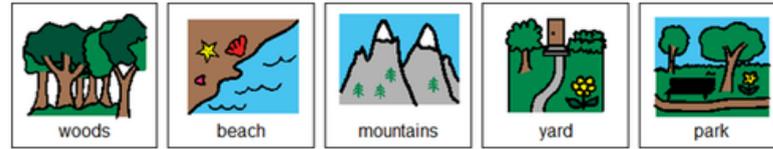
A deep breath of air

This morning I went to the and took a big breath of air.

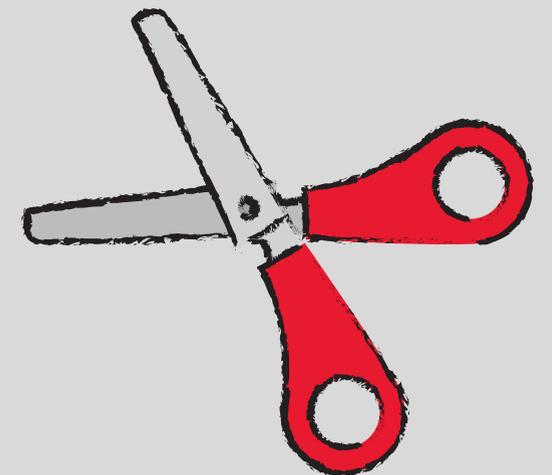
It made me feel so .

I realize fresh air is for the entire planet.

We all need to do to keep our air clean.



There is a writing prompt where students write a story about how it feels to take a deep breath of fresh air.

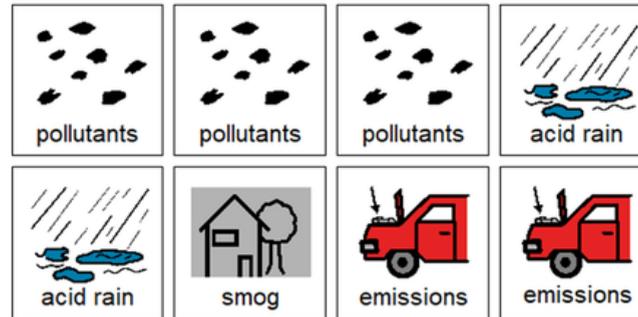


Air Pollution

| | | | | | |
|--|--|--|--|--|--|
| |  Clean Air Act | | | |  ozone |
| |  ozone | | |  acid rain | |
|  acid rain |  emissions |  ozone |  Clean Air Act | | |
|  Clean Air Act |  smog | | | |  emissions |
|  ozone |  pollutants |  Clean Air Act |  emissions |  smog | |
| |  acid rain |  smog |  ozone | |  pollutant: |

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Place the following images in the empty squares on the previous page, completing the sudoku puzzle.



Air Pollution

| | | | |
|--|--|--|--|
|  pollutants |  smog |  acid rain | |
| | | |  smog |
| |  emissions |  smog | |
| | |  emissions |  acid rain |

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There is a Sudoku puzzle in this unit as well. This is a great way to work with the new vocabulary!!

There are 2 versions plus answer keys.



Air Pollution

P Q U V P Z C P G K K Y K N C
A X C U F S E T Z D R K T Z A
R N A P L U P V O Q F D R H R
T D R H P L J W D Y J I K N B
I Q B M A F N S S Z W B H P O
C E O L P U K H H J D R N E N
U C N A I R A S W M A D T M D
L L M V Y D C O N S E M B I I
A T O S O I I Z Q M R S L S O
T D N B X O D O R O O L O S X
E K O H C X R N O G S M V I I
S R X C U I A E Q K O H J O D
I Q I P L D I D X G L J C N E
U W D E F E N C Q Y S J J S S
N M E G P O L L U T A N T S X

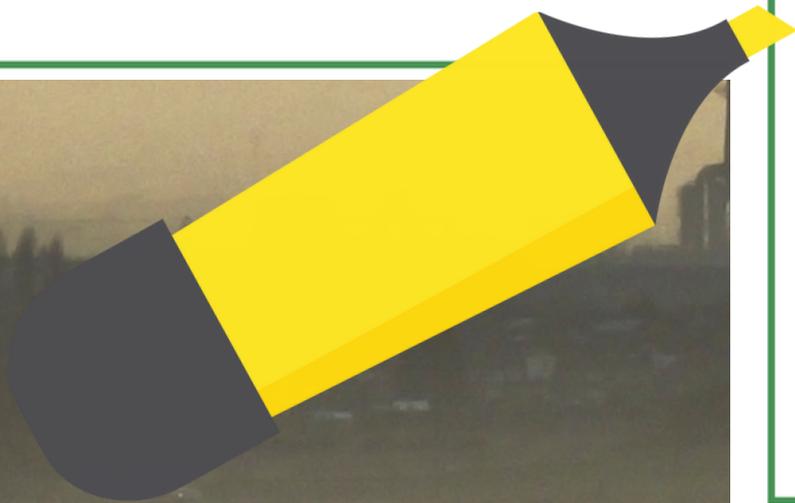
| | | | |
|-----------------|----------------|----------------|------------|
| carbon monoxide | sulfur dioxide | carbon dioxide | pollutants |
| emissions | particulates | acid rain | ozone |
| aerosols | smog | | |

Air Pollution

P Q U V P Z C P G K K Y K N C
A X C U F S E T Z D R K T Z A
R N A P L U P V O Q F D R H R
T D R H P L J W D Y J I K N B
I Q B M A F N S S Z W B H P O
C E O L P U K H H J D R N E N
U C N A I R A S W M A D T M D
L L M V Y D C O N S E M B I I
A T O S O I I Z Q M R S L S O
T D N B X O D O R O O L O S X
E K O H C X R N O G S M V I I
S R X C U I A E Q K O H J O D
I Q I P L D I D X G L J C N E
U W D E F E N C Q Y S J J S S
N M E G P O L L U T A N T S X

| | | | |
|-----------------|----------------|----------------|------------|
| carbon monoxide | sulfur dioxide | carbon dioxide | pollutants |
| emissions | particulates | acid rain | ozone |
| aerosols | smog | | |

There is also a word search to work with vocabulary. If your students cannot do a word search, have them highlight the circle words on the answer key.



Air Pollution

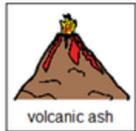
1. The Air Quality Index measures how many are in the air.

2. are put directly into the air by people or natural sources.

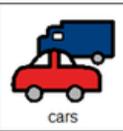
3. An example of a natural pollutant would be .

4. are one of the biggest causes of air pollution.

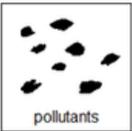
5. Burning oil and coal release dangerous aerosols like .



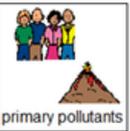
volcanic ash



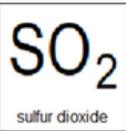
cars



pollutants



primary pollutants



sulfur dioxide

Air Pollution

are pollutants that mix with moisture in the air.

Smog is a mixture of and fog.

The ozone that gets trapped near the earth can be .

9. The Clean Air Act greatly reduced the amount of produced by cars.

10. is one thing you can do to reduce air pollution.



secondary pollutants



dangerous



emissions



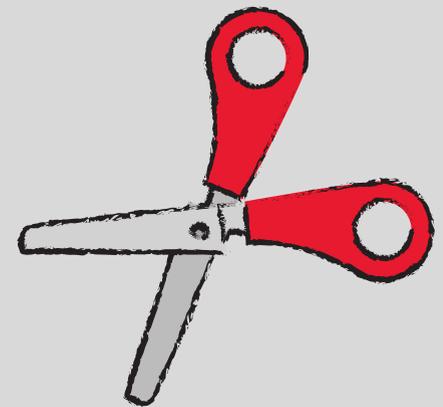
riding a bike



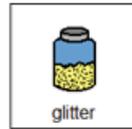
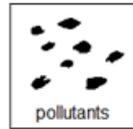
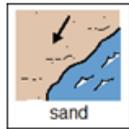
smoke

Close worksheets are a great informal assessment. There are two worksheets that cover the main points from the book.

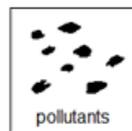
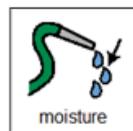
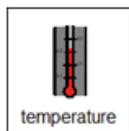
Answer key included.



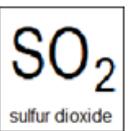
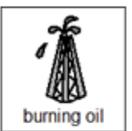
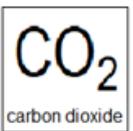
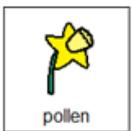
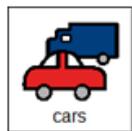
1. These can be solids, liquids or gases that get into the air and make it difficult to breathe?



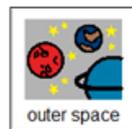
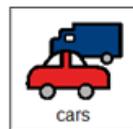
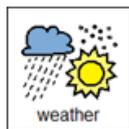
2. What does the Air Quality index measure in the air?



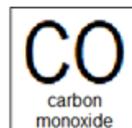
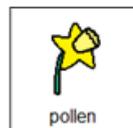
3. What are some primary pollutants? (circle all)



4. What is one of the largest causes of air pollution?



5. What is an odorless and deadly gas that cars produce?

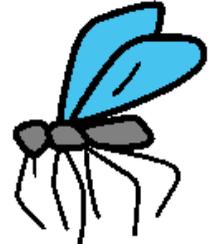
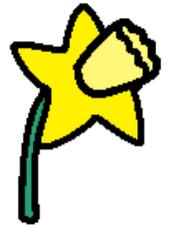


FINALLY the assessment!! There are 3 versions. This version has 10 questions with 3 picture choices for each question.

Answer key included.

Print onto cardstock or mount on index cards. Cut pictures apart and show student answer choices for each question.

Q 3

| | | |
|---|---|---|
|  <p>cars</p> |  <p>mosquito</p> |  <p>pollen</p> |
| CO_2 carbon dioxide |  <p>burning oil</p> | SO_2 sulfur dioxide |

Q 4

| | | |
|--|---|--|
|  <p>weather</p> |  <p>cars</p> |  <p>outer space</p> |
|--|---|--|

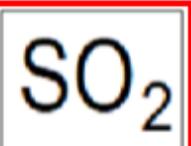
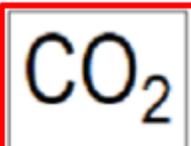
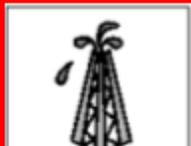
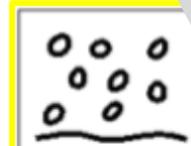
With this version, you cut out the answer choices and glue them on index cards. Ask the student the question, and they point to the correct answer.

Version 3

1. These can be solids, liquids or gases that get into the air and make it difficult to breathe?
 - A. Sand
 - B. Pollutants
 - C. Glitter
2. What does the Air Quality index measure in the air?
 - A. Temperature
 - B. Moisture
 - C. Pollutants
3. What are some primary pollutants? (circle all)
 - A. Cars
 - B. Mosquitos
 - C. Pollen
 - D. carbon monoxide
 - E. burning oil
 - F. Sulfur dioxide
4. What is one of the largest causes of air pollution?
 - A. Weather
 - B. Cars
 - C. Outer space
5. What is an odorless and deadly gas that cars produce?
 - A. Smog
 - B. Pollen
 - C. Carbon monoxide
6. What is an example of a secondary pollutant that come from the sky?
 - A. Rainbow
 - B. Acid rain
 - C. Clouds

This is your traditional multiple choice version. It can also be used as a recording sheet if your students are using the version with index cards.

This unit also has 38 google slides. There are 2 sets of slides (19 in each set). The second set is differentiated using color.

|  primary pollutants |  secondary pollutants | Sort the following into those that are primary or secondary pollutants. If you are not sure, place it on the center line. | | | |
|---|---|---|--|--|---|
| | |  SO ₂ sulfur dioxide |  CO ₂ carbon dioxide |  ozone |  volcanic ash |
| | |  smog |  burning oil |  dust storm |  factories |
| | |  burning coal |  energy |  acid rain |  acid sleet |
| | |  CO carbon monoxide |  acid snow |  emissions | |

Special Kids
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I realize there will be some students out there unable to do cutting activities. I have a blog post with ways to complete activities without a pair of scissors!!

All of the activities (except the book) come in color and black and white.