

Four Seasons Data & Graphing Investigations Bundle Middle School

- THREE Graphing Activities about the Seasons

- NO PREP - Just download and Go!



6th, 7th, 8th Grade



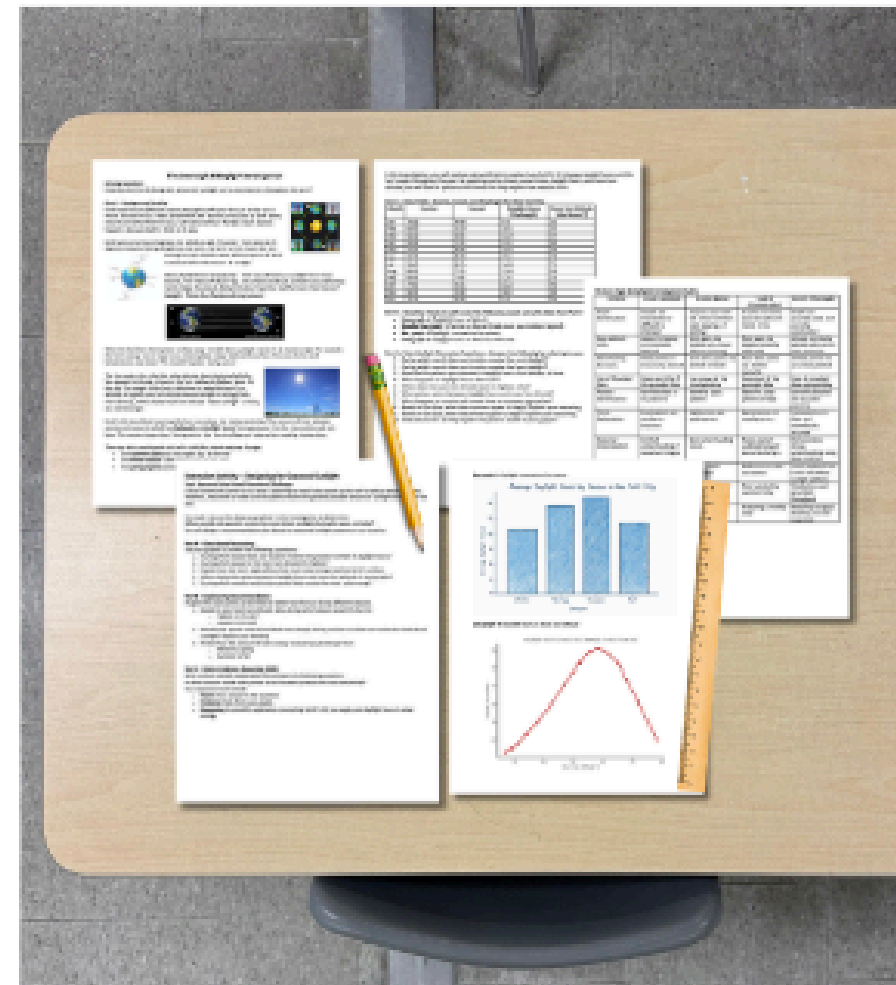
Students use Real World Data to create different graphs and answer questions related to the four seasons.

SCROLL
to take a look inside!

HOW THESE ACTIVITIES HELP YOU

- **Saves Prep Time** - Everything is pre-made, ready to go, and fully editable.
- **Provides Built-In Assessments** - The rubric let you quickly check for understanding.
- **Encourages evidence-based reasoning** by having students use graphs to explain how and why seasonal changes occur

THE SUN ANGLE AND DAYLIGHT GRAPHING LAB

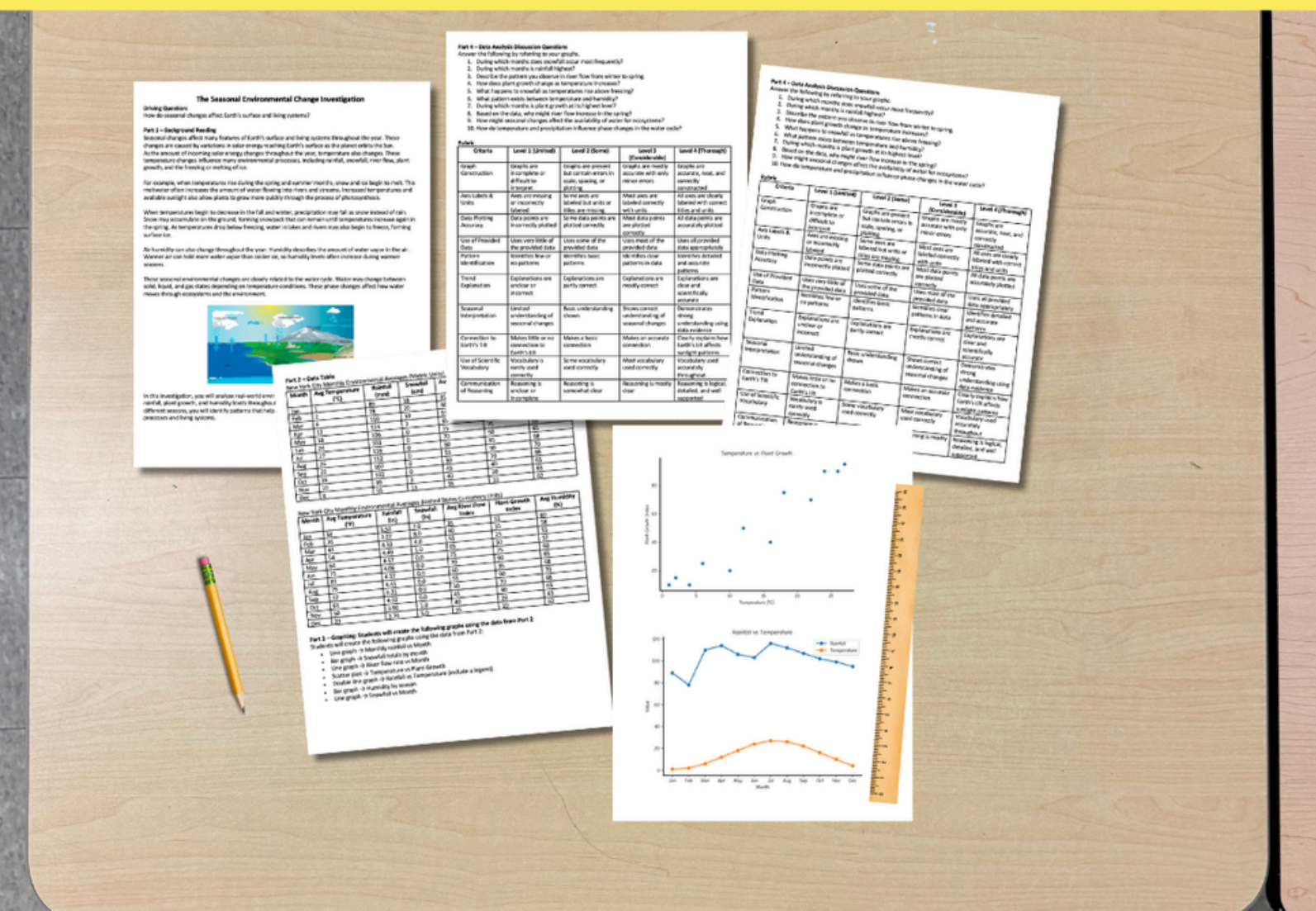


- Background Reading
- Seasonal Data Tables
- Students Create Different Graph Types
- Extension Activity
- Full Marking Rubric

NO PREP or Materials

What Will Your Students Learn?

THE SEASONAL ENVIRONMENTAL CHANGE INVESTIGATION



Students Use Their Graphs to Answer Questions and Draw a Conclusion

- ✓ Sun angle and daylight hours
- ✓ Seasonal temperature lag
- ✓ Thermal energy storage
- ✓ Heat capacity of land and water
- ✓ Monthly temperature patterns
- ✓ Rainfall and snowfall trends
- ✓ River flow and snowmelt
- ✓ Plant growth changes
- ✓ Air humidity patterns
- ✓ Phase changes in the water cycle
- ✓ Environmental resource availability
- ✓ Seasonal ecosystem changes

- **Three seasonal Earth science investigations** that use real-world data for students to graph and analyze
- **Multiple graphing tasks** (line graphs, bar graphs, scatter plots, and double line graphs) with data tables and analysis questions
- **Complete teacher supports** including answer keys, discussion questions, and extension activities with rubrics

What You Get

Average Daylight Hours by Season in New York City

Season	Average Daylight Hours
Winter	10.5
Spring	13.8
Summer	14.5
Fall	11.2

Part 3 – Graphing

Create the following graphs using the data from Part 2:

- Line graph → Average monthly temperature vs Month
- Double line graph → Temperature and Daylight Hours vs Month (include a legend)
- Bar graph → Average temperature by season
- Scatter plot → Daylight Hours vs Temperature

Part 4 – Data Analysis Discussion Questions

Answer the following by referring to your graphs.

1. During which month does our location receive the most daylight?
2. During which month does our location reach its highest average temperature?
3. Describe the pattern you observe in temperature from January to August.
4. What happens to daylight hours after June?
5. Does temperature begin to decrease immediately after daylight hours begin to decrease? Explain.
6. How many months after the longest day of the year do temperatures reach their highest value?
7. What pattern exists between daylight hours and temperature throughout the year?
8. Based on the data, why do temperatures continue to increase after June?
9. Based on the data, why do the coldest temperatures occur after December?
10. How does heat capacity help explain seasonal temperature lag?

Daylight Hours vs Noon Sun Altitude in New York City

Noon Sun Altitude (°)	Daylight Hours (hrs)
28	9.5
32	9.8
36	10.2
40	10.8
44	11.5
48	12.2
52	13.0
56	14.0
60	14.8
64	15.2
68	15.0
72	14.5
76	13.5
80	12.2

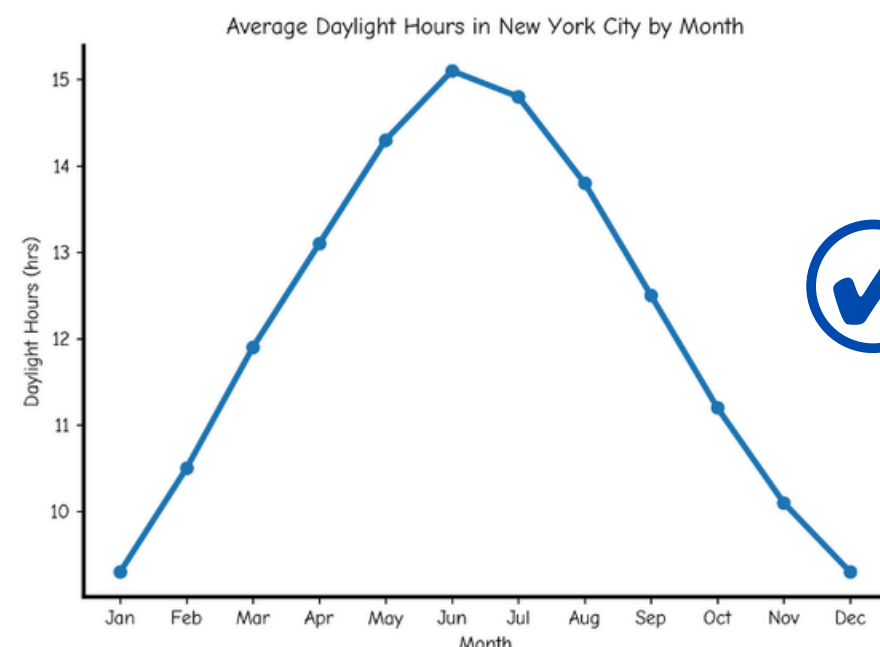
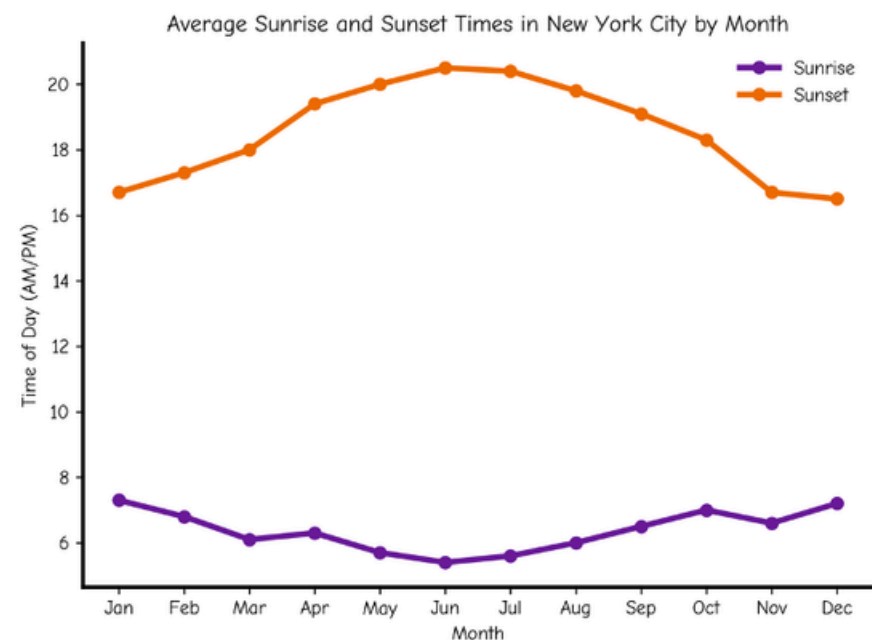
Criteria	Level 1 (Limited)	Level 2 (Some)	Level 3 (Considerable)	Level 4 (Thorough)
Graph Construction	Graphs are incomplete or difficult to interpret	Graphs are present but contain errors in scale, spacing, or plotting	Graphs are mostly accurate with only minor errors	Graphs are accurate, neat, and correctly constructed
Axis Labels & Units	Axes are missing or incorrectly labeled	Some axes are labeled but units or titles are missing	Most axes are labeled correctly with units	All axes are clearly labeled with correct titles and units
Data Plotting Accuracy	Data points are incorrectly plotted	Some data points are plotted correctly	Most data points are plotted correctly	All data points are accurately plotted
Use of Provided Data	Uses very little of the provided data	Uses some of the provided data	Uses most of the provided data	Uses all provided data appropriately
Pattern Identification	Identifies few or no patterns	Identifies basic patterns	Identifies clear patterns in data	Identifies detailed and accurate patterns
Trend Explanation	Explanations are unclear or incorrect	Explanations are partly correct	Explanations are mostly correct	Explanations are clear and scientifically accurate
Seasonal Interpretation	Limited understanding of seasonal changes	Basic understanding shown	Shows correct understanding of seasonal changes	Demonstrates strong understanding using data evidence
Connection to Earth's Tilt	Makes little or no connection to Earth's tilt	Makes a basic connection	Makes an accurate connection	Clearly explains how Earth's tilt affects sunlight patterns
Use of Scientific Vocabulary	Vocabulary is rarely used correctly	Some vocabulary used correctly	Most vocabulary used correctly	Vocabulary used accurately throughout
Communication of Reasoning	Reasoning is unclear or incomplete	Reasoning is somewhat clear	Reasoning is mostly clear	Reasoning is logical, detailed, and well supported

What Will Your Students Learn?

- ✓ Helps students build **graphing and data analysis skills** using real-world seasonal environmental data
- ✓ **Supports NGSS Science & Engineering Practices** through analyzing patterns and relationships in data
- ✓ Connects abstract Earth science concepts (like sunlight, temperature, and the water cycle) to real seasonal changes
- ✓ Encourages evidence-based reasoning by having students use graphs to explain how and why seasonal changes occur

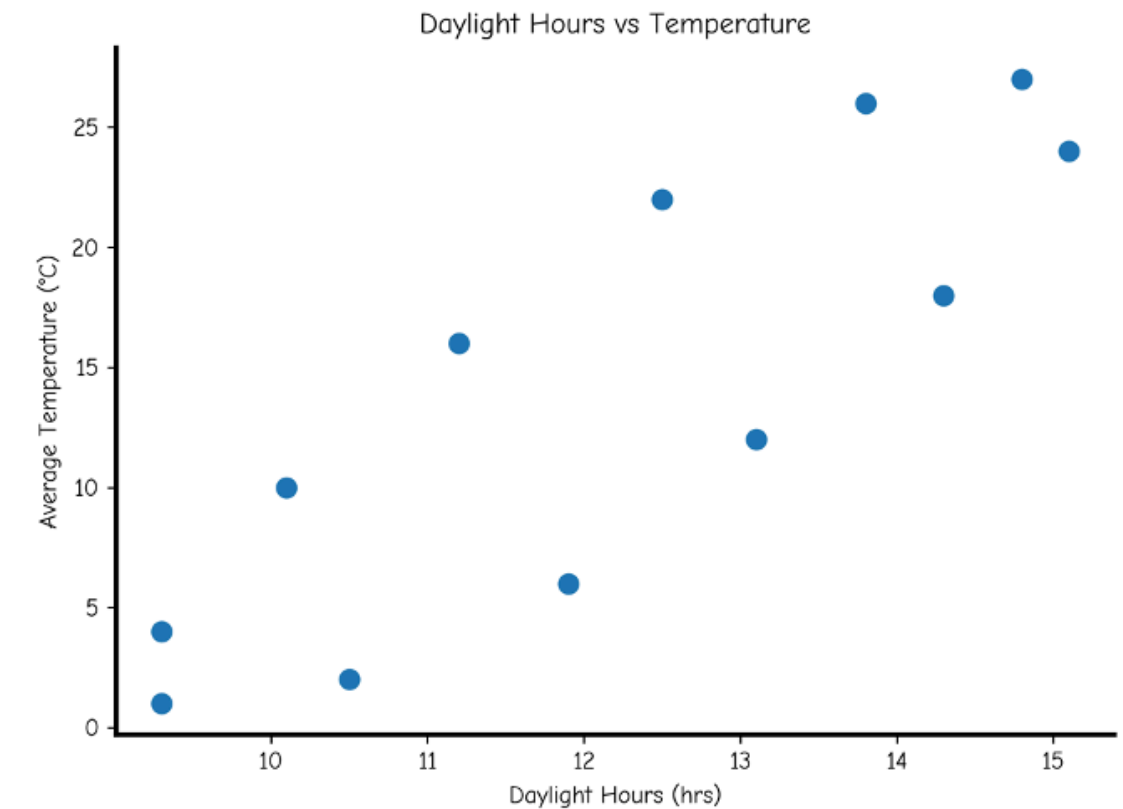
Part 2 – Data Table - Sunrise, Sunset, and Daylength for New York City

Month	Sunrise	Sunset	Daylight Hours (Daylength)	Noon Sun Altitude Solar Noon (°)
Jan	7:20	4:40	9.3	25
Feb	6:50	5:20	10.5	35
Mar	6:10	6:05	11.9	47
Apr	6:20	7:25	13.1	60
May	5:45	8:00	14.3	69
Jun	5:25	8:30	15.1	73
Jul	5:40	8:25	14.8	71
Aug	6:05	7:55	13.8	63
Sep	6:35	7:05	12.5	52
Oct	7:05	6:15	11.2	40
Nov	6:35	4:40	10.1	30
Dec	7:15	4:30	9.3	25



Your Activities

- **DIGITAL and PRINT** ready
- **Fully editable** - insert your own location's data or use the included information
- **Extension activities** for early finishers
- **Metric and United States Customary Units**



Part 2 – Data Table
New York City Monthly Environmental Averages (Metric Units)

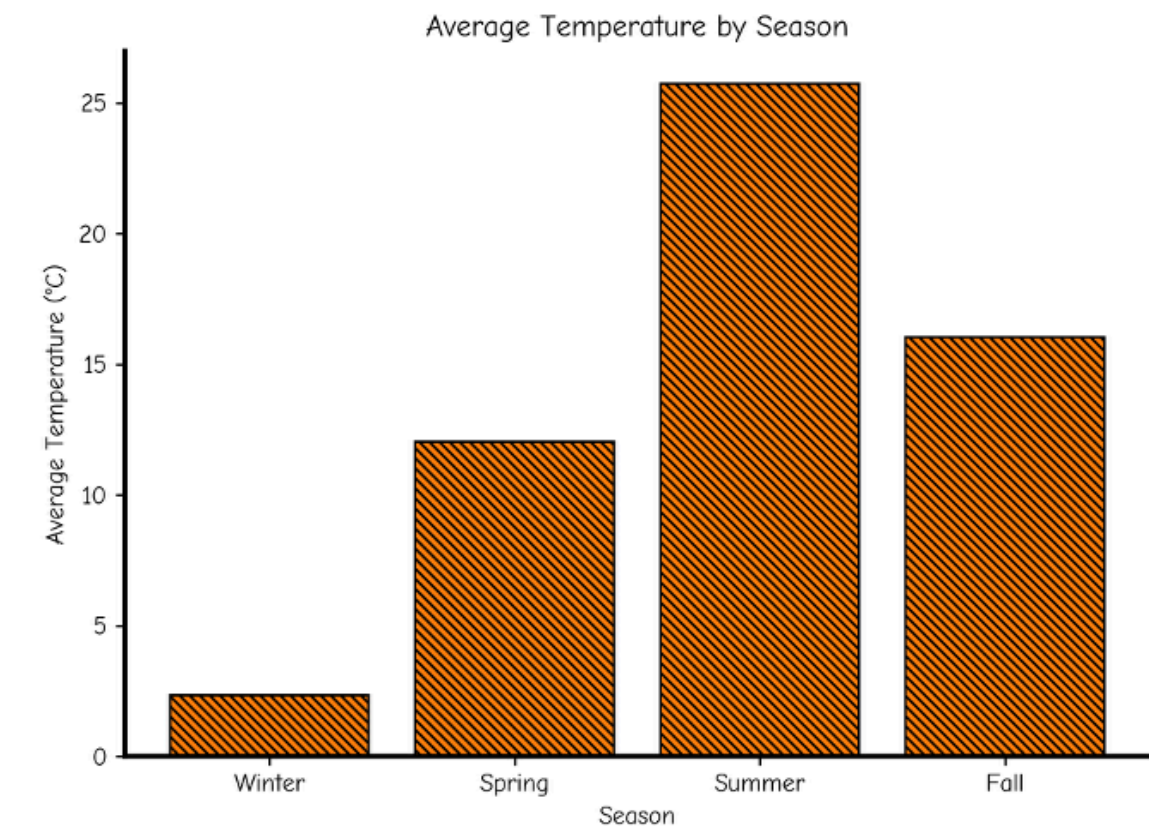
Month	Avg Temperature (°C)	Rainfall (mm)	Snowfall (cm)	Avg River Flow Index	Plant Growth Index	Avg Humidity (%)
Jan	1	89	18	35	10	60
Feb	2	78	20	40	15	58
Mar	6	110	10	55	25	55
Apr	12	114	3	65	50	57
May	18	106	0	75	75	60
Jun	24	103	0	70	90	65
Jul	27	116	0	60	95	68
Aug	26	112	0	55	90	70
Sep	22	107	0	50	70	68
Oct	16	102	0	45	40	65
Nov	10	99	3	40	20	63
Dec	4	95	13	35	10	62

New York City Monthly Environmental Averages (United States Customary Units)

Month	Avg Temperature (°F)	Rainfall (in)	Snowfall (in)	Avg River Flow Index	Plant Growth Index	Avg Humidity (%)
Jan	34	3.50	7.0	35	10	60
Feb	36	3.07	8.0	40	15	58
Mar	43	4.33	4.0	55	25	55
Apr	54	4.49	1.0	65	50	57
May	64	4.17	0.0	75	75	60
Jun	75	4.06	0.0	70	90	65
Jul	81	4.57	0.0	60	95	68
Aug	79	4.41	0.0	55	90	70
Sep	72	4.21	0.0	50	70	68
Oct	61	4.02	0.0	45	40	65
Nov	50	3.90	1.0	40	20	63
Dec	39	3.74	5.0	35	10	62

Part 3 – Graphing: Students will create the following graphs using the data from Part 2:
Students will create the following graphs using the data from Part 2:

- Line graph → Monthly rainfall vs Month
- Bar graph → Snowfall totals by month
- Line graph → River flow rate vs Month
- Scatter plot → Temperature vs Plant Growth
- Double line graph → Rainfall vs Temperature (include a legend)
- Bar graph → Humidity by season
- Line graph → Snowfall vs Month



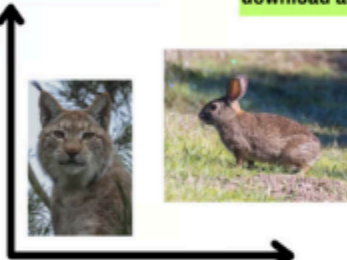
Middle School Science Graphing & Data Analysis Bundle

Get all my Graphing and Data Analysis Activities at a **HUGE** discount. Additionally, you'll get access to all additional activities I create in the future.

Population Ecology Data Graphing Bundle Middle School

THREE Graphing Activities

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Human Body Systems Graphing Bundle Middle School

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Force & Motion Graphing Bundle - Middle School

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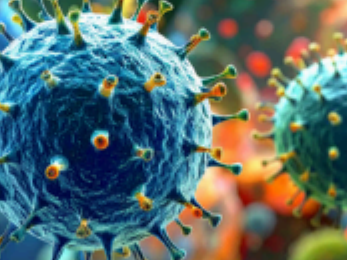


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Disease Spread & Public Health Data Bundle Middle School

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Space Data Investigation Bundle: Planet Motion, Moon Phases, and Stars - Middle School

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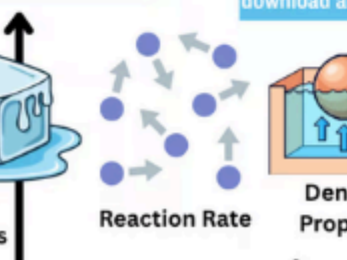


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Matter & Chemical Change Data Graphing Bundle Middle School

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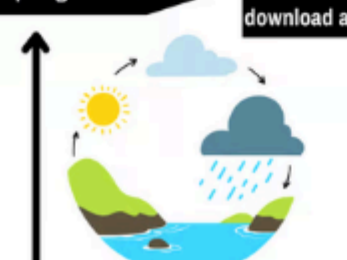


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Water Cycle Data Graphing Bundle Middle School

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Energy Transfer & Heat Graphing Bundle Middle School

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Climate Change & Long Term Trends Graphing Bundle Middle School

THREE Graphing Activities about the Climate Change

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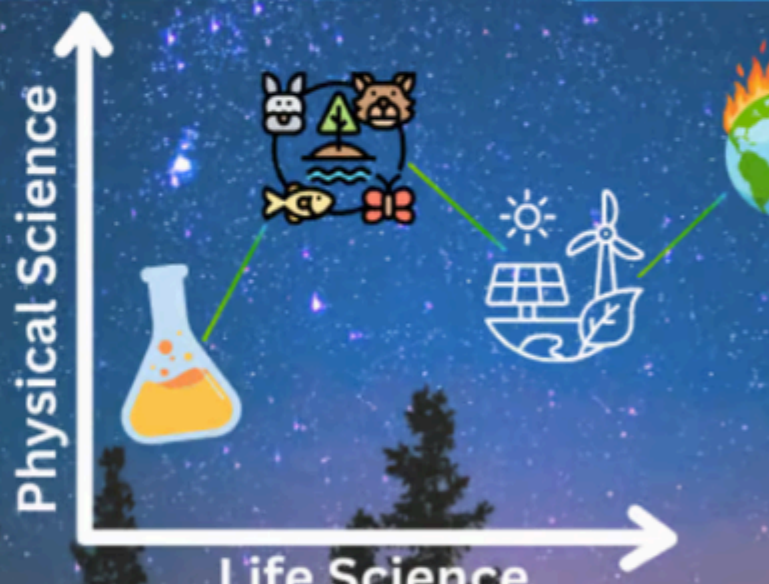


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Middle School Science Graphing & Data Analysis Mega Bundle

Graphing Activities Across ALL TOPICS

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Physical Science

Life Science

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Thanks
**for your interest
in this resource!**

I am a real person and if
you have any questions,
suggestions, or concerns,
please reach out.



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*Let's
Connect!*

