

# ADVANCED LEARNING LABS

A partnership between the North Carolina Department of Public Instruction and Duke TIP  
TO ENGAGE, ACTIVATE, AND GROW OUR STUDENTS

GRADES

2-3

## Lab 6 • Growth



### ENGLISH LANGUAGE ARTS

Characters that grow and change over the course of a story are often the most interesting. Authors can teach us about a character through physical descriptions and what the character says, does, thinks and feels.

Think of a fictional story where a character has changed over the course of the story. Think about ways people can change and write a story in which a character changes over the course of the narrative.

How is that change reflected in the behavior of the character? How has that character shown growth in his/her actions and behaviors?



### SOCIAL STUDIES

Communities grow and change over time depending on different factors and events. Some differences are more obvious than others. Review the data for the 15 fastest growing cities in the United States between 2018-2019. Why do some cities experience such rapid growth in a short period of time?

**Link:** <https://www.census.gov/library/visualizations/2020/demo/fastest-growing-cities-2010-2019.html>

Create a T-chart and list reasons a city or local area's population may grow (for example: new businesses or more homes being built) on one side, and why they may decrease on the other side. Share your findings with a family member!



### SCIENCE

Blowing bubbles is like sneezing in slow motion. Blow some bubbles and notice how they travel and where they land.

Do you notice a pattern in how they travel and spread? How is this similar to sneezing? In what ways is sneezing different? Can you think of a better way to model it?

Based on your observations, explain why our hygiene practices (washing hands, covering mouth when coughing or sneezing, etc.) when we are sick are effective.

You can make bubbles with 1/4 cup of dish soap and 1 1/2 cups of water.



### MINDFULNESS

Have you ever made a mistake? Believe it or not, making mistakes is a very important part of learning. When you make a mistake, you have the unique opportunity to learn and grow from that mistake.

Think back on the school year and identify two mistakes that you made. What did you learn from these mistakes? How would you do things differently now?

Share what you learned with an adult whom you love. Give them the opportunity to share with you about lessons that they have learned from their own mistakes that contributed to their growth.



## LOGIC PUZZLE

Decode the Fallen Letters

Uncover the joke in this puzzle by placing the correct letters into each square. The list of available letters is given at the bottom of each column.

Follow this link: <https://bit.ly/3e68XSY>



## FIELD STUDIES

M & M's candies were first introduced in 1941 and at one point were only sold to the military! Since their introduction, they have grown to become a staple in the candy industry. Watch the 360 video tour at the link below to learn how M & M's candy is made.

Link: [https://youtu.be/GtfkemNzG\\_I](https://youtu.be/GtfkemNzG_I)

Why do you think M & M's candy has grown in popularity since it started? How do you think technology has improved the way they make the candy over the years?



## RESEARCH EXPLORATIONS

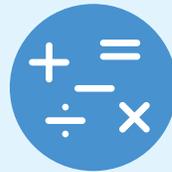
What conditions are best for growing a fruit or vegetable in your home?

Pick one food that you can grow from leftover scraps and seeds that you have at home or can get.

Link: <https://www.buzzfeed.com/jesseszewczyk/16-food-scraps-that-you-can-regrow>

Try to grow that food with three different conditions. The "traditional" way uses sun, water, and soil. Then change one condition for each of the other two plants – for example, provide more/less sunlight or water to one, or play music for one every day. Every three days, draw a picture of what they look like.

After three weeks, write what conclusions you can draw about growth, based on your experiment.



## MATH

Salt Dough is a recipe you can use to make keepsakes (like a model of your handprint) that show how much you've grown.

The recipe is simple: 2 cups of flour, 1 cup of salt, 1 cup of water. One batch makes 24 keepsakes. You want to make the dough but you only have 1/2 cup of salt. How much flour and water should you use? You have 36 people for whom you want to make keepsakes. By how much do you grow the recipe?

Extension: With an adult's help, use the recipe and directions here to make and bake something.

Link: <https://www.yummytoddlerfood.com/activities/the-best-salt-dough-ornaments/>



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GRADES

4-5

## Lab 6 • Growth



### ENGLISH LANGUAGE ARTS

Characters that grow and change are often the most interesting. Authors teach us about a character through physical descriptions and what the character says, does, thinks and feels.

Pick a favorite short story or book in which there are at least two characters that change and grow over the course of the narrative. Compare the ways in which their growth is described by the author.

Write an essay comparing and contrasting two or more characters. Include how the events in the story contribute to the growth of the characters, and how each characters' growth is reflected in their actions or behaviors.



### SOCIAL STUDIES

Populations grow and change over time depending on different push and pull factors.

Push factors are the different reasons that people leave a place and pull factors are reasons that people go to a new place to live. What pull factors are there in your local area? Are there any push factors where you live?

Interview 10 friends, family members, or neighbors who have moved in their lifetime to find out why their families moved. Create a graph for the push and pull factors.



### SCIENCE

How do you think sneezing and touching can pass diseases?

Design a model of how one sick person can pass their illness to 8 people but has only been in close contact with 2. Predict what would happen with even more interactions.

What purpose do skin and nose hair serve to protect us from illness? Why is it recommended to use hand washing and wearing masks to protect us, if skin and nose hairs are also working to protect us?

For an example of how sneezing can spread germs, view the link below:

[https://docs.google.com/document/d/1ub3Z\\_VEHenSeHuxd7he4xHBxrTsExwzTa\\_JhFsXTWYw/edit?usp=sharing](https://docs.google.com/document/d/1ub3Z_VEHenSeHuxd7he4xHBxrTsExwzTa_JhFsXTWYw/edit?usp=sharing)



### MINDFULNESS

A "growth mindset" means believing your abilities can improve through your will to learn and hard work.

Print or draw a copy of this image to fill out at the end of each day this week.

**Link:** <https://tofasakademi.com/wp-content/uploads/2019/06/growth-mindset3.png>

On the soil or roots, write 3 specific things that you learned that day. On a stem, write 2 specific things that you want to learn. Lastly, on a leaf write 1 specific question you still have. Look at how much you have grown during the week!

Learn about growth mindset from Dr. Carol Dweck, the researcher who developed the idea, as well as entertainer John Legend. <https://bit.ly/3c3rgXI>



## LOGIC PUZZLE

Decode the Riddle

Uncover the riddle in this puzzle by placing the correct letters into each square. The list of available letters is given at the bottom of each column.

Follow this link: <https://bit.ly/2LPePUk>



## FIELD STUDIES

M & M's candies were first introduced in 1941 and at one point were only sold to the military! Since their introduction, they have grown to become a staple in the candy industry. Watch the 360 video tour at the link below to learn how M & M's candy is made: Link: [https://youtu.be/GtfkemNzG\\_I](https://youtu.be/GtfkemNzG_I)

Why do you think M & M's candy has grown in popularity since it started? What is an example of another product that has grown in success over the past 20 years? What do you attribute to their success?

For more information about M & M candy, see this article: <https://www.history.com/news/the-wartime-origins-of-the-mm>



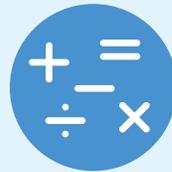
## RESEARCH EXPLORATIONS

What conditions are best for growing a fruit or vegetable in your home?

Pick one food that you can grow from leftover scraps and seeds that you have at home or can get.

Try to grow that food three different ways, while changing one condition resulting in three different methods. Traditionally, we use sun, water, and soil to grow food. Try two other ways that alter one of those conditions (more/less sunlight or water, type of music played, etc.). Every three days, draw a picture of what they look like and label the plant parts.

After three weeks, write what conclusions you can draw about growth based on your experiment.



## MATH

As a growing child, you probably eat a lot of pizza. Pizza dough has 7 ingredients: 2 cups flour, 1 package of yeast, 1 1/2 tsp sugar, 3/4 tsp salt, 1/8 tsp garlic, 2 tbsp oil, 3/4 cup water. One batch makes one 12-slice pizza.

You're very hungry and want 4 pizzas. How much of each ingredient do you need? If you have 1 cup of flour, how does the recipe change? What do you need to make 3 slices for each person in your house? How many pizzas is that?

Extension: At home, with adult help, try the recipe.

Link: <https://sugarspunrun.com/the-best-pizza-dough-recipe/>



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GRADES

6–7

## Lab 6 • Growth



### ENGLISH LANGUAGE ARTS

Intellectual curiosity allows you to take an active role in life by observing and questioning your environment. There are several components of intellectual curiosity: curiosity, independent thinking, concentration, focus, auditory memory, and visual memory. Carefully consider each of these components and describe which you believe is the most important to have. Also consider your own level of competence for each component. In order to help you think about and write about which is most important to have, create a rating scale and rate each component for yourself and for roles in society (teachers, scientists, doctors). What can individuals do to cultivate a lower-rated component? Create either a written argumentative essay, multimedia presentation, or infographic to express your thinking.



### SOCIAL STUDIES

Population growth and decline is important for government officials and demographers to track. Population data can show everything from famine, war, and times of large growth.

Watch this video to understand more details about what we can learn from population pyramids and how the pyramid is set up. Now, you will create your own pyramids. The first step is to gather the data, but at the link below you can use data already compiled. Draw your two pyramids and determine the differences between the two pyramids.

From the data which country is more developed and why? Review the link below for an example of a population pyramid data set. [https://docs.google.com/spreadsheets/d/1Df9nSNBROw83Lstzgl-u07r\\_lzM9rhG4H1qEMNUyIqM/edit#gid=0](https://docs.google.com/spreadsheets/d/1Df9nSNBROw83Lstzgl-u07r_lzM9rhG4H1qEMNUyIqM/edit#gid=0)



### SCIENCE

The 1918 flu was deadly and unique not only in virulence but also by whom was affected.

Review this graph of the 1918 death rate by age group compared to the seasonal flu bug in previous years.

**Link:** <https://wwwnc.cdc.gov/eid/article/12/1/05-0979-f2>

What do you notice? Predict how that death rate affected the population growth long term.

Based on your predictions, what do you think would be the impact on society?



### MINDFULNESS

A “growth mindset” means believing your abilities can improve through a willingness to learn and hard work.

This graphic compares growth vs. fixed mindset. Create a T-chart. On the fixed side, write 1 specific example for each aspect listed (ex: Challenges, obstacles, etc.) of a time when you acted with a fixed mindset and what you could have done differently from a growth perspective. On the growth side, write 1 specific example (for each) of how you will act with a growth mindset this week.

**Link:** <https://bit.ly/2yU32S3>

Learn about growth mindset from Dr. Carol Dweck, the researcher who developed the concept, as well as entertainer John Legend. <https://bit.ly/3c3rgXI>



## LOGIC PUZZLE

Quote Square:

“I’ve never thought of that!”

Use investigation and process of elimination to reveal what that statement is talking about.

Follow this link: <https://bit.ly/35SBjn7>



## FIELD STUDIES

New York City has one of the most recognizable skylines in the world. Today we will take a tour to look at how NYC’s skyline grew into what we know today.

Watch this video from Bloomberg that focuses on the Equitable Building.

Link: <https://www.youtube.com/watch?v=lGrolrQmwyw>

Zoning resolutions guide the growth of a city or town through regulations. Do you think that cities should enforce zoning laws? Explain why or why not?

Design and draw your own city skyline and include your own zoning laws.



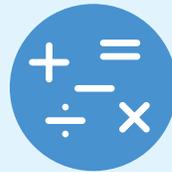
## RESEARCH EXPLORATIONS

What conditions are best for growing a food at home?

Pick one food that you can grow from leftover scraps and seeds that you have at home or can get.

First research what conditions are best for that plant to grow. Try to grow that food changing one condition three ways: the “traditional” way (using sun, water, and soil) and altering that one condition (more/less sunlight or water, type of soil or water, temperature, etc.).

Choose three ways to measure how well they grow over three weeks and take those measurements daily. What conclusions can you make about growth after three weeks, based on the data?



## MATH

Why do people easily spend \$5 on a frozen pizza but don’t take advantage of a 3 for \$12 special when each pizza is actually \$1 less? Last year, Clark.com did a Target vs. Walmart price comparison.

Link: <https://clark.com/shopping-retail/target-walmart-price-comparison/>

Review the website and make a chart, or use a spreadsheet, to find the unit price for each item. Find the item on [target.com](https://www.target.com) and [walmart.com](https://www.walmart.com) and record the current unit price.

How have the rates changed? Do you think the pandemic has had an impact on pricing? Why is unit rate not the only factor in consumer purchasing decisions?



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GRADES

8–9

## Lab 6 • Growth



### ENGLISH LANGUAGE ARTS

Extinction of species is both natural and man-made. As the human population grows, resource consumption and habitat loss are inevitable. Research multiple causes of extinction across biomes, including human-to-environment interactions. What alternatives would you propose to mitigate habitat loss and prevent or minimize extinction?

Create a visual presentation that showcases two critical cases from your research of extinction and presents your solutions.

Make sure to check your sources for accuracy and cite them in your presentation. Share your presentation with a friend and family member and ask them what they notice and wonder about what is being represented.



### SOCIAL STUDIES

Throughout time, technology has evolved and populations have grown as cities became larger. You'll play the Urban Game this week to help simulate how cities have grown since the 18th century. There are a few versions of this game online, but the link below explains all the steps with great detail. After you have developed your city, answer the following questions:

What struggles do you think people in your city would have with the layout? Do you think your city has benefits from its design? How are cities that are founded after 1950 different?

**Link:** <https://geographyeducationdotorg.files.wordpress.com/2017/06/industrialization-game-analysis.pdf>



### SCIENCE

Infectious diseases grow exponentially based on the number of people 1 sick person will likely infect, the R0 value. Compare that to the percentage of people who die from the disease once infected, the case fatality rate (CFR).

**Link:** <https://bit.ly/2XeTwAQ>

What do you notice? Are there trends? What questions would you need to research to investigate whether these trends apply more widely?

While it cannot yet be known accurately, the current coronavirus has an estimated R0 range 2-3 and CFR 1.3-5%, how do these fit in with your trends?



### MINDFULNESS

One key to success is having a Growth Mindset—believing that you are in control of your own ability and can learn and improve! This graphic compares growth vs. fixed mindset.

<https://bit.ly/2yU32S3>

Apply a growth mindset this week by being mindful of the things you say to yourself when you are frustrated or upset. Instead of thinking...

- This is too hard—Try this— I can do hard things!
- I'm not smart enough—Try this— I'm getting smarter every day!
- That was a dumb mistake—Try this— Mistakes help me grow!

Study more about a Growth Mindset and begin to work toward making it a life skill.



## LOGIC PUZZLE

Quote Square:

“I’ve never thought of that!”

Use investigation and process of elimination to reveal what that statement is talking about.

Follow this link: <https://bit.ly/2Ztnd4d>



## FIELD STUDIES

The stock market experiences periods of rapid economic growth and decline. Throughout the history of the United States there have been numerous depressions and periods of growth. However, for many, the Stock Exchange is a mysterious place.

Follow this video tour with the President of the New York Stock Exchange. Link: [https://www.youtube.com/watch?v=lqhib\\_8h0tc](https://www.youtube.com/watch?v=lqhib_8h0tc)

What role does the Stock Exchange play in globalization? Why do companies work to want an evaluation and a place on the Stock Exchange?



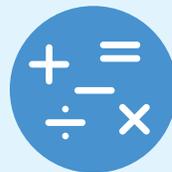
## RESEARCH EXPLORATIONS

What conditions are best for growing food at home?

Pick two foods that you can grow from leftover scraps and seeds that you have at home or can get.

First research what conditions are best for those plants to grow. Try to grow those foods changing one condition three ways: the “traditional” way (using sun, water, and soil) and altering that one condition (more/less sunlight or water, type of soil or water, temperature, etc.).

Choose three ways to measure how well they grow, and measure daily. What conclusions can you make about growth after three weeks, based on the data, and how does it differ by plant?



## MATH

You have explored linear equations and probably even quadratic & exponential equations. Now, explore these and other types of equations to create a virtual art piece!

Use the blank graph on [desmos.com](https://www.desmos.com) to create your design. Create equations and use {brackets} to add domain and range to enhance the details of your design. For inspiration check out the art gallery.

Graphing Link: <https://www.desmos.com/calculator>

Art Gallery Link: <https://www.desmos.com/art>



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DUKE UNIVERSITY  
TALENT IDENTIFICATION PROGRAM

PROJECT COMPLETED IN RESPONSE TO COVID-19 • SPRING 2020

[www.dpi.nc.gov/students-families/enhanced-opportunities/advanced-learning-and-gifted-education](http://www.dpi.nc.gov/students-families/enhanced-opportunities/advanced-learning-and-gifted-education) • [tip.duke.edu](http://tip.duke.edu)

## Lab 6 • Growth

### Works Cited and Answers

#### Research Explorations:

Link for All: <https://www.buzzfeed.com/jesseszewczyk/16-food-scrap-that-you-can-regrow>

Additional 4-5 Link: <https://empressof dirt.net/regrow-vegetable-scrap/>

Additional links for All: <https://www.ruralsprout.com/regrow-vegetables/>

#### Math:

2-3 Recipe Link: <https://www.yummytoddlerfood.com/activities/the-best-salt-dough-ornaments/>

4-5 Recipe Link: <https://sugarspunrun.com/the-best-pizza-dough-recipe/>

#### Answers:

**2-3 Answers:** With a 1/2 c of salt, you need 1 c of flour and 1/2 cup of water. If you need 36 keepsakes, you need 1 1/2 times the ingredients - 3 c flour, 1 1/2 c salt, 1 1/2 c water.

**4-5 Answers:** To make 4 pizzas, you need 4 times each ingredient - 8 c flour, 4 packages of yeast, 6 tsp/2 tbsp sugar, 3 tsp/1tbsp salt, 1/2 tsp garlic, 8 tbsp oil, 3 c water. With 1 c flour, you need to cut all ingredients in half - 1/2 package yeast, 3/4 tsp of sugar, 3/8 tsp salt, 1/16 tsp of garlic, 1 tbsp oil, 3/8 c water.

#### Advanced Learning Lab 6

##### NC Standards Alignment

Math	
K-1	N/A for Lab 6
2-3	NC.3.NF.1, NC.3.NF.2, NC.3.NF.3
4-5	NC.4.NF.2, NC.4.NF.3, NC.4.NF.4; NC.5.NF.1, NC.5.NF.3, NC.5.NF.4; NC.5.NF.7
6-7	NC.6.RP.3 NC.7.RP.1
8-9	NC.M1.A-CED.1 NC.M2.A-CED.1 NC.M3.G-GPE.1
10-12	N/A for Lab 6
English Language Arts	
K-1	N/A for Lab 6
2-3	W 3.3.c
4-5	RL 5.3
6-7	W.1
8-9	W.9-10.6
10-12	N/A for Lab 6
Science	
K-1	N/A for Lab 6
2-3	3.L.1
4-5	5.L.1
6-7	7.L.2
8-9	8.L.1
10-12	N/A for Lab 6
Social Studies	
K-1	N/A for Lab 6
2-3	3.H.1
4-5	5.G.1.4
6-7	6.G.2.2
8-9	AH1.H.3
10-12	N/A for Lab 6