7th grade Calendar Math Notes for the year

 **August**

**Components:** Counting Tape, Percent Circle, Daily Pattern, Daily Variable, Daily Measurement

**Counting Tape and Percent Circle:** Continue☺

**Daily Pattern**~Recognize the Fibonacci Number sequence
~Practice mental math
~Connect mathematical patterns to the real world.

**Materials:**Chart

**Setup/Routine
Make a chart like the one shown below**

|  |  |
| --- | --- |
| **Day of the Month** | **Fibonacci Number** |
| 1 |  |
| 2 |  |
| 3 |  |

~Each day record the new number in the Fibonacci series.
~Update skipped days on the first day back in school
~Place an envelop next to the chart and allow students to write down their ideas on the Fibbonacci Pattern during the first 2 weeks.
~It is not recommended to actually discuss the Fibbonacci Sequence until 2 weeks have passed so that students have time to ponder about the pattern☺
~After the second week discuss the pattern weekly.

(Remember, the numbers will get very large very fast☺)

Discussion:
How do you think these numbers are generated?
What number do you think will come next?

**Daily Variable**: Use variables and mathematical symbols to describe relationships. Evaluate mathematical expressions.
Material: Chart Poster

|  |  |
| --- | --- |
| Date |  2 x date + 50 = value  |
| 1 | 2 | 50 | 52 |
| 2 | 4 | 50 | 54 |
| 3 | 6 | 50 | 56 |

1st week: use 2 x date + 50 = value

3rd week: use 2d +50=value

Last week: use 2*x*  + 50 = value

Possible Discussion Questions:

What will tomorrow’s value be? What will be the value on the \_\_\_\_ day, how do you know?

 What do we call “d” (a variable).

What happens to my value if I change the “d” to an “x”? Why?

2x+50 is called what?

2d+50=value is called what?

What is the different between 2x+50 and 2x+50=value

**Daily Measurement**: Find Surface area and volume of cubes. Visualize nets of 3D shapes. Discover relationships among edges, surface areas, and volumes of cubes.

Materials: Isometric Dot paper, Chart/Poster

|  |  |  |  |
| --- | --- | --- | --- |
| Edge(cm) | Surface Area(cm²)  | Volume(cm³) | Ratio: $\frac{Surface Area}{Volume}$ |
| 1 | 6 | 1 | 6.0 |
| 2 | 24 | 8 | 3.0 |
| 3 | 54 | 27 | 2.0 |

**SEPTEMBER**

**Calendar and Pieces:** Recognize factors for numbers to 30: Identify as prime, composite and square numbers
 Possible Discussion Questions: What will be the next prime number? What do the numbers 12, 18, 20 have in common? What is the least number that has 4 and 5 as factors? Etc..

**Counting Tape and Percent Circle:** Continue with /177 also add horizontal Integer number line.

 Discussion Points:
Location of integers on a number line, absolute value, opposites, compare integers, add integers, add integers
Possible Questions to Consider:
 Where is -15 in relation to -5? Where is -15 in relation to +5.
Why is the difference between -15 and 15 30? (Opportunity to talk about add the inverse/opposite)
6th grade teachers: this is an opportunity for you to explore adding and subtracting integers.
7th/8th grade teachers: This is an opportunity to throw in daily practice of adding/subtracting integers.

**ARRAYS:** You will need 10X10 squared paper (attached). Make all of the possible array arrangements for the day you are on.

What is the area of each array? What is the relationship between the number of factors and the number of arrangements? Numbers that have only one arrangement are what kind of number? Which numbers make squares?

**Daily Variable:**

 n²

~ solve and graph

**October:**

**Calendar and Pieces:** Recognize factors for numbers to 61: Identify as prime, composite and square numbers
 Possible Discussion Questions: What will be the next prime number? What will be the next square number? Are there are any Cubed numbers?

**ARRAYS**: **Prime Factorizations!!!**

Materials: Marker, Construction Paper, and 10x10 squared paper (TR1)

Routine: Student will cut our Rectangle for the date. Divide the rectangle into smaller rectangles to get the prime factorization (SEE pg. 53 of your manual for example)

**On the Construction Paper for the day:** Have the Rectangle that was divided into smaller rectangles AND the Factor Tree. This shows 2 different methods for finding the Prime Factorization.

Chart: have a chart with the prime factorizations (see below)

|  |  |
| --- | --- |
| Number | Prime Factorization |
| 2 | Prime |
| 3 | Prime |
| 4 | 2 x 2 OR $2^{2}$ |
| Etc | etc |

**Counting Tape and Percent Circle:** Continue with /177 also add vertical Integer number line.

**Counting Tape:**Same as last month except your number line is Vertical.

Each day add the positive and negative post it note for the date. At the start of the month make sure students see that the positive integers are now above zero and negative are below (in March: Positive was to the right and Negative was to the left).

Discussion Points:
~What real world examples apply a “vertical” number line (Sea Level, elevators, thermometers, etc)
~Reinforce adding and subtracting of integers

**Daily Depositor**: Develop an understanding of common percents and calculate percent using mental math.
Materials: Index Cards, Index Card Pocket, Calendar Money

Routine: Students will multiply the date by 100 and find 10% of the product. Have a student deposit that amount of money into the Depositor Poster. Student also needs to update the total amount of money in the Daily Depositor on an Index Card.

Possible Discussions:

~Where do we see 10% in the real world?

~At the end of each week have students predict how much money will be in the depositor at the end of the following Friday.

~How much money will be in the depositor at the end of the month.

~On the last day: How do you think we will determine how much money to put into the depositor if we change 10% to 20%?

~On the last day of the month: If we added 10% to the depositor every day of each month, about how much money will we have deposited at the end of the year? Will we put the same amount of money in each month?

**November:**

**Calendar and Pieces:** Recognize and analyze quadrilaterals and their properties (Same as November, but the pattern should change, *ALSO, you will notice that as the pattern repeats the shapes ROTATE 90 degrees, so even though we will not be here for all of the days, you still might want to go through all of the days to see the rotations☺).*

 **This month’s NEW Discussion Points:** Pay Attention to diagonals and perpendicular diagonals and pairs of congruent sides.

**Also, reference the chart on page 68 of teacher book:** There is a great Diagram you might want to have students fill out before we leave for winter break.

**ARRAYS**: **DIVISIBILITY RULES**

Materials: Adding Machine Tape

Objective: Recognize factors and divisibility rules.

You will have a vertical strip for each day of the month. The vertical will be a different length for each day because as you progress through the days you will write the current “date” under the “past” dates that are factors of your current date.

For example: On the 20th: You will have a Vertical Strip for 20, then you will write the number 20 under dates 2, 4, 5, and 10 because all of those “dates” will divide evenly into 20.

Pages 89 and 90 are good pages to read and reference from your teacher book.

Here are the lengths you will want to make sure daily strips:

2-Strip 32 inches
3- strip 22 inches
4- strip 16 inches
5 strip 14 inches
6 Strip 12 inches
7 Strip 10 inches
8 and 9 strips 8 inches
10-15 strips 6 inches
16-31 strips 4 inches

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 224681012141618202224262830 | 348121620242836912151821242730 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |

Notice: All Even dates get entered under January 2nd because 2 is a factor of all even numbers
 All dates who are divisible by 3 are entered under January 3rd
 All dates who are divisible by 4 are entered under January 4th
You do not add the “dates” to the strips until you get to the date. You will not put January 12th under the 2, 3, 4, or 6 under you actually get to the 12th.

The goal is for students to recognize factors, create and use divisibility rules.
**Extensions:**
 Have students consider where the “Years” would fall. Example: The year 2012 would be placed under 2, 3, 4, 6. Where would 2011 have been? What will the next year be that can fall under 5? 10?

Pages 90 and 91 have good discussion guides, take a look☺

**Counting Tape and Percent Circle:** Continue with /177

**Daily Variable:**

 2x² + (-13) Solve and Graph

**December**

**Counting Tape and Percent Circle:** Continue with /177

**Daily Pattern**: Describe/analyze relationships b/w area and perimeter.
Materials: Inch Squared paper (TR3), scissors, tape, chart poster
Poster will need to use 3 columns

|  |  |  |
| --- | --- | --- |
| Figure Number | Area ($in^{2})$ | Perimeter (in) |
| 1 | 1 | 4 |
| 2 | 2 | 6 |

Routine: Each day have a student use the Inch Squared Paper and cut out a rectangle as many inches long as the day of the month and two units wide.

Day 1 would be a 2x1 (See page 44 of teacher Manuel for visual)

Day 2 would be a 2x2

Day 3 would be a 2x3

Day 4 would be a 2x4 etc…………….

 **Suggestion**: do not record data for the first 5 days).

 Possible Discussion Questions: Are there different ways to find the perimeter? What are the different formulas we could use? Are there different formulas for the area? Why? If there were 50 days in October what would the area and perimeter be? If there were 100 days what would the area and perimeter be? How does this compare to the 10th, 20th, 30th day?

**Daily Variable:**

x³ solve and graph

**Daily Depositor**: Develop an understanding of common percents and calculate percent using mental math.
Materials: Index Cards, Index Card Pocket, Calendar Money

Routine: Students will multiply the date by 100 and find 20% of the product. Have a student deposit that amount of money into the Depositor Poster. Student also needs to update the total amount of money in the Daily Depositor on an Index Card.

Possible Discussions:

~Where do we see 20% in the real world?

~At the end of each week have students predict how much money will be in the depositor at the end of the following Friday.

~How much money will be in the depositor at the end of the month.

~On the last day: How do you think we will determine how much money to put into the depositor if we change 20% to 30%?

~On the last day of the month: If we added 20% to the depositor every day of each month, about how much money will we have deposited at the end of the year? Will we put the same amount of money in each month?

**January**

1. **Calendar and Pieces:** Lines of Symmetry for quadrilaterals.

Pattern:4 day pattern, first shape no symmetry, 2nd shape has 1 line of symmetry, 3rd shape has 2 lines of symmetry and the 4th shape has 3 lines of symmetry.

Discuss the shapes about 6-8 times throughout the month.

Questions to consider asking throughout the month:

 ~ Do trapezoids ever have lines of symmetry?

 ~ How do the lines of symmetry of a rhombus compare to a rectangle (Rhombus: connect opposite vertices and a rectangle connects the midpoints of the sides)

 ~If a rectangle, rhombus, and a square are all parallelograms do their lines of symmetry all have the same characteristics? Explain

**Counting Tape and Percent Circle:** Continue☺

**Daily Circle**~Recognize probability on the area of a circular spinner
~Theoretical vs. Experimental probability
~Identify the sample size in experimental probability

**Daily Pattern**:
Objective:
Recognize non-linear patterns, recognize square numbers, use variety of strategies to find the sum of terms in a sequence

Materials: Centimeter Squared Paper (TR9), construction paper, scissors, tape, chart paper.

Routine:
1) Use centimeter paper to create a labeled square for each day of the month. On a piece of construction paper Label the length and width of each square and give the Area of each square .
2) Record the figure and Cm squares on a chart:

|  |  |
| --- | --- |
| Figure | Cm Squares |
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |

Students should discover the pattern in the date squared☺

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|  |  |
| --- | --- |
| Figure | Cm Squares |
| 1 | 1 |
| 2 | 4 |
| 3 | 9 |
| 4 | 16 |

Students should discover the pattern in the date squared☺

**February:**

**Calendar Pieces:**
~identify and Recognize properties of Polyhedra
~reinforce faces, edges and vertices

Discussion Points:
~Faces, edges, vertices. It is suggested to make a chart to display the different edges/vertices/faces/etc
~Regular vs. non-regular 3d figures
~Lateral Faces (Prisms vs. Pyramids)
~Euler’s Formula (Faces + Vertices = Edges +2 )
~Why were cylinders, spheres and cones not present this month? (because polyhedra are made up of polygons)

**Counting Tape and Percent Circle:** Continue☺

**Daily Circle:**

**Daily Variable:**

 2x³ - 100 Solve and graph

**DAILY DATA: Stem and Leaf Plots**

Materials: Chart Paper to make the stem and leaf plot. December Line Plot to make a back to back stem and leaf plot. See page 103 in your book

Routine:
1)At the same time each day record the temperature for the day on the stem and leaf plot

HELPFUL HINT: Use Post It Notes to Record on the Stem and Leaf Plot so that you can keep the data in numerical order by easily moving the post its around when needed

Discussion Questions:
~ Discuss the advantages of using a stem and leaf plot to record data

~ Use the stem and leaf plot to calculate mean, median, mode, and range
~Discuss other medians (Interquartile range, Lower quartile range, Upper Quartile Range)

~ Take the data from December (line plot) and create a back to back stem and leaf plot with December on the left and January on the Right.

**March:**

**Daily Circle:**

**Objectives:**

Use mathematical Language to describe circles

Discover the relationships among radius, diameter, and circumference

Use metric units of length in formulas

Recognize π as a ratio

**Materials**

February Circles

Centimeter ruler showing millimeters

String

Scissors

Chart paper

calculators

Label sample Circles in ascending size 1-7. Set up a blank chart like the one shown below (DO NOT FILL IN ALL COLUMOM TITLES ON THE FIRST DAY)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Circle | Radius(cm) | Diameter(cm) | Circumference(cm) | CircumferenceDiameter |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |
| 6 |  |  |  |  |
| 7 |  |  |  |  |

(2 students do the measurements to check for agreement, if the measurements are slightly off, average the two measurements.

FIRST DAY: **~** review definitions of Circle, radius, diameter, circumference
~ Select Circle 1 and have 2 students measure the radius with a centimeter ruler. Enter the measurement in the second column of chart.

**SECOND DAY:**
Ask two students measure the Diameter of the Circle 1 and record in the third column.

**THIRD DAY:**Ask two students to measure the circumference by using STRING. Lay the string tightly around the circle (ribbon might work better than string). Cut the string and measure the string.

REPEAT Days 1-3 for all measurements of the 7 circles throughout the month.

The 5th Column should remain empty till the end of the month.

After 2-3 circles have been completed discuss the relationships seen in the chart.

LAST COLUMN: What do we get for the ratio of Circumference: Diameter for each Circle. What does this value look like. What does this ratio mean? What can it help us calculate? What is the relationship between diameter and the ratio found? How does this relate to circumference?

**DAILY DATA:**
Recognize Trends on a Line Graph, advantage of using line graphs, use double line graph to display and analyze data.

Materials: Chart Paper and Markers

~Record both the HIGH and the LOW temperatures for this month.

~Have one color to represent the highs and another color to represent the lows.

Discussion Questions:
~What does the graph look like if the high (or low) remains the same for 2 or more days?
~ What days did the high and lows increase?
~On which days did the high increase while the low decreased?
~ What is the greatest number of consecutive days where the low “declined”
~Describe the trend of high temps for the month/low temps for the month.

1. **Daily Pattern**: Recognize the area of right isosceles triangles as half the area of a square.
**Materials:** Centimeter Squared Paper (TR9), chart paper, scissors, tape

**Set Up:** Use centimeter paper to create right isosceles triangles with legs from 1 centimeter through 28. Make a chart like the one shown below

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Triangle | Length of Leg (cm) | Full Squares | Half Squares | Area ($cm^{2}$) |
| 1 | 1 | 0 | 1 | 0.5 |
| 2 | 2 | 1 | 2 | 2 |
| 3 | 3 | 3 | 3 | 4.5 |

Routine: Each day, post a right triangle with leg lengths equal to the days date. Update the chart with data from the triangle. Update skipped days. Discuss the patterns once or twice a week.

There is great discussion topics/formula relationships on pages 115-116 that I highly recommend you read…..Some of the “highlights” for pattern investigation are:

~ How many quare are in Triangle n…………. ($\frac{n^{2}}{2})$

~ How is the area of the triangle related to the length of the leg ($\frac{l^{2}}{2})$

~What is the formula for the area of an isosceles triangle? (½ leg x leg)

~ How many times the area of Triangle 10 is the area of Triangle 20?

(4 times the area)

~How many times the area of Triangle 10 is the area of Triangle 30?

(9 times each leg is 3 times a long).

**April:**

**Calendar and Pieces:** Polygons and Rotations/Rotational Symmetry. The Teacher/Student dialogue on pages 106-107 have a GREAT modeling technique for rotational symmetry, I highly suggest you read and do with the kids…..it will really help with visual learners. (EX: have 2 congruent circles….stack one on top of the other, as you turn the top one will they match? At what degree will they match? Have 2 congruent kites. Stack one on top of the other; turn the top one, will they ever match up?)

**Discussion** Discuss Rotational Symmetry.
Which shapes have Rotational Symmetry?
 At what degree of turn(s) does the rotation symmetry occur?
 Discuss how rotation symmetry compares to line symmetry.
Do all shapes that have line symmetry have rotational symmetry????
Do all shapes that have rotational symmetry have line symmetry????

**Daily Circle: Radius and Area**Materials: February Circles, Centimeter Ruler, string, scissors, chart paper, calcualtors
WEEKLY ROUTINE: Once time a week, have 2 students measure on of the circles with the centimeter ruler (you have two students measure to check for accuracy). If measurements agree enter the amount into the chart. If the measures are different, average the two measurements.

|  |  |  |
| --- | --- | --- |
| Circle | Radius (cm) | Area ($cm^{2}$) |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |

Have students use the formula $A=πr^{2}$ to calculate the area of the circle and record it in the chart. Discuss comparisons among the different circles each week.

Extension Questions:
~What has a greater area: A square with a side length of 1 cm or a circle with a radius of 1cm?
~What has a greater area: A square with a side length of 2 cm or a circle with a diameter of 2 cm?
~7th Grade: Area and Circumference of Circles is your standard in the Common Core. So you might want to have students calculate different area and circumference values using the date as the radius and or diameter for additional practice.
~8th grade: You might want to take the same advice as above…….8th graders are to already know how to find area of circumference of a circle, if this is a gap area for your kids, give them extra practice.

**Daily Variable:**

$F=\frac{9}{5} C+32$ Solve and graph

**Daily Data: Histogram**Materials: Chart paper, 100-centimeter length of adding machine tape, metric ruler, daily temperature.

Daily Routine:

**REFERENCE YOUR PURPLE CALENDAR BOOK ON PAGES 142-145 FOR DETAILED INSTRUCTIONS**

Each day (for 25 days worth of data) record the temperature onto the histogram like the one shown below

 **March Temperature
Degrees in Fahrenheit**

|  |  |
| --- | --- |
| 0 to 9 |  |
| 10-19 | XX |
| 20-29 | XXXXX |
| 30-39 | XXXX |
| 40-49 | XXXXXXX |
| 50-59 | XXXXXXXX |
| 60-69 | XXXXX |
| 70-79 | X |

REFERENCE YOUR PURPLE CALENDAR BOOK ON PAGES 142-145 FOR DETAILED INSTRUCTIONS

After the 25 days, transfer the data to a strip of adding machine tape, allotting 4 centimeters per day. Work as a group to create a circle graph as described on pg. 143.

**Daily Measurement: Metric Measurements**
Materials: Adding Machine Tape
Setup: Cut eight 1-yard lengths of adding machine tape and add centimeter and decimeter marks to each.

Daily Routine:
ONCE A WEEK: post 2 fresh 1-meter strips
1. Have a student write the date as a number of hundredths of a meter.
2. Ask the student to cut one strip to that length, and one strip to show that number of hundredths of 2 meters
3. Have another student label the 2 cut strips
4. Discuss the relationship between centimeters and decimals fractions or percent of a meter

Examples of Discussion Questions:
~What are some thing in the classroom that are about 1 meter long.
~On the 5th that is 0.05 of a meter, how many centimeters is that?

~How many 5 centimeter lengths will fit onto a meter? 10 centimeter lengths? 25 centimeter lengths?
~What is 0.28 of 200 centimeters? How do you know? Answer: 56 centimeters because I know 0.28 of 1 meter is 28 centimeters so I double that for 2 meters.