# Englewood Public School District <br> Mathematics <br> Grade 2 <br> Second Marking Period 

Unit - Bar Models
Overview: During this unit, students will learn how to use bar models for addition and subtraction.
Time Frame: Chapter 4-12 days, Additional Standards - 5 days, Chapter 7 - 12 days, Chapter 10 - 10 days (Pacing includes 1 day for Chapter Opener pages if needed.)

## Enduring Understandings:

Addition and subtraction can be shown with bar models.
Even groups having even numbers of objects will pair up evenly.
Odd groups having odd numbers of objects will not pair up evenly.
An array can be used as a model to represent repeated addition.
Objects have distinct attributes that can be measured.
Centimeter rulers and meter sticks can be used to measure and compare how long and how tall things are.
Mental math can be used when an exact answer is needed.

## Essential Questions:

How are bar models helpful in addition and subtraction?
How can you determine if a number is odd or even?
How does an array represent repeated addition?
How would you decide with which unit to measure an object with?
How can 10 help you to add and subtract mentally?

| Standards | Topics and Objectives | Activities | Resources | Assessments |
| :---: | :---: | :---: | :---: | :---: |
| Chapter 4 |  |  |  |  |
| 2.NBT.B.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction. | Topics <br> Adding and subtracting using bar models. <br> Twenty-First Century Themes and Skills include: | 2.OA.A. 1 Pencil and a Sticker <br> Math Playground http://www.mathplayground. com/ | SE-2A: 96-123 <br> Workbook 2A: 73-98 <br> Common Core Focus Lesson Appendix <br> Think Central: Online access | Formative Assessments: <br> - Do Now <br> - Exit Ticket <br> - Math Journal <br> Entries (CRP4) |

2.NBT.B.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.B.7. Add and subtract within 1000 , using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.
2.NBT.B.9. Explain why addition and subtraction strategies work, using place value and the properties of operations. (Explanations may be supported by drawings or objects.)
2.MD.B.5. Use addition and subtraction within 100 to solve word problems involving lengths that are given in the same units, e.g., by using drawings (such as drawings of rulers) and equations with a symbol for the unknown number to represent the problem.

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration


## Objectives

Students will be able to:

- Use bar models to solve addition and subtraction problems.
- Apply the inverse operations of addition and subtraction.
- Model addition as joining sets.
- Model subtraction as taking away.
- Model addition and subtraction as comparing sets.
- Use bar models to solve two-step addition ad subtraction problems.


## Math Coach - Fact

Fluency
http://schoolwires.henry.k1
2.ga.us/Page/21865

Math Wire - Basic Facts
Link
http://mathwire.com/numb
ersense/bfactslinks.html

| Math Fact Practice |
| :--- |
| http://www.playkidsgames. |
| com/games/mathfact/math |
| Fact.htm |

## Fact.htm

Critical Thinking and
Problem Solving p.121:
Put on Your Thinking Cap!
Children's books:
https://www.the-best-
childrens-books.org/math-for-kids.html

## More additional texts:

www.newsela.com
www.readworks.org
www.commonlit.org
to all Math in Focus materials listed above and Virtual Manipulatives

Professional Resources: The
Model Method from the
Ministry of Education
Singapore and Bar Modeling: A
Bar Modeling Tool by Yeap
Ban Har, PhD.
Lesson and Component
Walkthrough:
www.hmhelearning.com

## Technology Resources

- Math in Focus eBooks
- Math in Focus Teacher Resources CD

North Carolina Dept of Ed. Wikispaces:
http://maccss.ncdpi.wikispaces. net/Elementary

## Arizona Flip Book

http://www.azed.gov/azccrs/fil es/2013/11/2flipbookedited.pd -

Delaware DOE Common
Core Item Bank for
Mathematics - Grade 2
http://www.doe.k12.de.us/cms
/lib09/DE01922744/Centricity
/Domain/111/Math Grade_2-
Nov.pdf
Worksheets, games, lesson
plans:
https://www.education.com/re
sources/second-grade/math/

- Math notebook
(NJSLSA.W2.)
- Calendar skills
- Observations
- Discussions: in groups, have students explain different ways of solving problems (CRP4, 8.2.2.E.1)


## Summative

## Assessments:

Math in Focus
Assessments

- Chapter Review/Test - pp 122-123
- Assessments 2 -pp.19-24
- ExamView Assessment Suite Test and Practice Generator
- Short answer / multiple choice assessments (8.2.2.E.1)
- Performance Task

Benchmark Assessment:

- Exact Path


## Alternative Assessments:

- Online assessments: https://www.opened. com/search?area $=$ m athematics\&grade=2 \&resource_type=ass essment (CRP2,

| 2.MD.B.6. Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers $0,1,2$ and represent wholenumber sums and differences within 100 on a number line diagram. | (8.1.2.E.1) | CRP4, CRP8) |
| :---: | :---: | :---: |
|  |  | - Learning centers: |
|  | http://www.mathchimp.com/2 | center focuses on |
|  | nd-grade-math-resources | a different type of |
|  | (8.1.2.E.1) | problem |
|  | www.khanacademy.org | (8.2.2.E.1) |
|  | (8.1.2.E.1) | - Graphs, charts, diagrams |
| 2.OA.A.1. Use addition and subtraction within 100 to solve one- and two-step word problems involving situations of adding to, taking from, putting together, taking apart, and comparing, with unknowns in all positions, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem. (See Table 1.) | Activities, worksheets, lesson plans, curriculum: http://www.jumpstart.com/pa |  |
|  | rents/resources/grade-based- |  |
|  | resources/2nd-grade- |  |
|  | resources |  |
|  | (8.1.2.E.1) |  |
|  | Everyday math resources: http://www1.center.k12.mo.us |  |
|  | /edtech/edm/2.htm |  |
|  | (8.1.2.E.1) |  |
| Mathematical Practices MP.1, MP.2, MP.3, MP.4, MP.5, MP.6, MP.7, MP. 8 | Explanation of math journals: |  |
|  | https://thecornerstoneforteac hers.com/math-iournals/ |  |
|  | (CRP4, NJSLSA.W2) |  |
|  | Math journals: https://www.k- |  |
|  | 5mathteachingresources.com |  |
|  | /math-journals.html <br> (CRP4, NJSLSA.W2) |  |

## Additional Standards

| Note: Skip Chapters 5 \& 6. | Topics | $\underline{2 . O A . C .3 ~ R e d ~ a n d ~ B l u e ~}$ | Common Core Focus Lesson <br> Appendix | Formative Assessments: <br> The following standards are |
| :--- | :--- | :--- | :--- | :--- |

represented through
multiplication in Chapters 5 and 6. Multiplication is a third grade skill. These are standards will need to be taught using supplemental materials. Refer to the Resources column for suggested sites.
2.OA.C.3. Determine whether a group of objects (up to 20) has an odd or even number of members, e.g., by pairing objects or counting them by 2s; write an equation to express an even number as a sum of two equal addends.
2.OA.C.4. Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Determining odd and even numbers. Using arrays to represent repeated addition and to write equations.

Twenty-First Century Themes and Skills include:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration


## Objectives

Students will be able to:

- Pair up to 20 object, count by 2 s and determine whether the group contains an even or odd number of objects.
- Write an equation to express an even number as a sum of two equal addends.
- Use repeated addition to find the total, with objects arranged in an array.
- Write an equation to express repeated addition, with objects arranged in an array.
2.OA.C. 4 Counting Dots in Arrays


## Math Playground

http://www.mathplayground. com/

Math Coach - Fact
Fluency
http://schoolwires.henry.k1
2.ga.us/Page/21865

Math Wire - Basic Facts
Link
http://mathwire.com/numb
ersense/bfactslinks.html

## Math Fact Practice

http://www.playkidsgames. com/games/mathfact/math Fact.htm

Children's books:
https://www.the-best-
childrens-books.org/math-
for-kids.html
More additional texts:
www.newsela.com
www.readworks.org www.commonlit.org

Think Central: Online access to all Math in Focus materials listed above and Virtual Manipulatives

Professional Resources: The Model Method from the Ministry of Education Singapore and Bar Modeling: A Bar Modeling Tool by Yeap Ban Har, PhD.

Lesson and Component Walkthrough:
www.hmhelearning.com

## Technology Resources

- Math in Focus eBooks
- Math in Focus Teacher Resources CD


## North Carolina Dept of Ed.

 Wikispaces:http://maccss.ncdpi.wikispaces. net/Elementary

## Arizona Flip Book

http://www.azed.gov/azccrs/fil es/2013/11/2flipbookedited.pd f

Delaware DOE Common Core Item Bank for
Mathematics - Grade 2 http://www.doe.k12.de.us/cms lib09/DE01922744/Centricity /Domain/111/Math_Grade_2Nov.pdf

Standards Solution Lessons: CCSS Lesson Plan:

- Exit Ticket
- Math Journal Entries (CRP4)
- Math notebook (NJSLSA.W2.)
- Calendar skills
- Observations
- Discussions: in groups, have students explain different ways of solving problems (CRP4, 8.2.2.E.1)


## Summative

## Assessments:

Math in Focus
Assessments

- ExamView Assessment Suite Test and Practice Generator
- Short answer / multiple choice assessments (8.2.2.E.1)


## Alternative Assessments:

- Online assessments: https://www.open ed.com/search?are a=mathematics\&gr ade=2\&resource ty pe=assessment (CRP2, CRP4, CRP8)
- Learning centers: each learning center focuses on


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| :--- | :--- | :--- | :--- | :--- | :--- |



|  | $\underline{\text { hers.com/math-journals/ }}$ |
| :--- | :--- |
| (CRP4, NJSLSA.W2) |  |
| Math journals: |  |
|  | $\underline{\text { https://www.k- }}$ |
| 5mathteachingresources.com |  |
| lmath-journals.html |  |
| (CRP4, NJSLSA.W2) |  |

## Chapter 10 (skip 10.5)

2.NBT.B.5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
2.NBT.B.6. Add up to four two-digit numbers using strategies based on place value and properties of operations.
2.NBT.B.7. Add and subtract within $\mathbf{1 0 0 0}$, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in addling or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to

## Topics

Mental math
Twenty-First Century Themes and Skills include:

- Creativity and Innovation
- Critical Thinking and Problem Solving
- Communication and Collaboration


## Objectives

Students will be able to:

- Relate "sum" to the addition operation.
- Add numbers with up to 3digits mentally with and without regrouping.
- Relate "difference" to the subtraction operation.
- Subtract numbers with up to 3-digits mentally with and without regrouping.

| Math Playground <br> http://www.mathplayground. com/ | 27; 39-41 | Formative Assessments: |
| :---: | :---: | :---: |
|  | Workbook 2B: 1-14; 20-22 | Do Now |
|  |  | Tic |
|  | Appendix | Math Journa |
| Math Coach - Fact |  | tries (CRP4) |
| Fluency htip://schoolwire |  | Math notebook |
| 2.ga.us/Page/21865 | Think Central: Online access to all Math in Focus materials | (NJSLSA.W2.) |
|  | listed above and Virtual | Calendar skills |
| Math Wire - Basic Facts Link | Manipulatives | Observati |
|  |  | iscussions: in |
| http://mathwire.com/numb ersense/bfactslinks.html | Professional Resources: The | groups, have |
|  | Model Method from the | students expla |
|  | Ministry of Education <br> Singapore and Bar Modeling: A | different ways of |
| Math Fact Practice http://www.playkidsgames. |  | solving problems |
|  | Bar Modeling Tool by Yeap | (CRP4, 8.2.2.E.1) |
| com/games/mathfact/math | Ban Har, PhD. |  |
| Fact.htm | Lesson and Component | Summ |
|  |  | Assessments: |
| Critical Thinking and Problem Solving p.39: Put on Your Thinking Cap! | Walkthrough: | Math in Focus |
|  | www.hmhelearning.com | Math in Focus |
|  |  | Assessments |
|  | Technology Resources | - Chapter |
| Children's books: https://www.the-best-childrens-books.org/math-for-kids.html | - Math in Focus eBooks <br> - Math in Focus Teacher Resources CD | Review/Test |
|  |  | 40-41 |
|  |  | - Assessments 2 -pp.85-87 |
|  | North Carolina Dept of Ed. | ExamView |


| compose or decompose tens or hundreds. | More additional texts: www.newsela.com | Wikispaces: http://maccss.ncdpi.wikispaces. net/Elementary | Assessment Suite Test and Practice Generator |
| :---: | :---: | :---: | :---: |
| 2.NBT.B.9. Explain why | www.readworks.org |  | - Short answer / |
| addition and subtraction <br> strategies work, using place | www.commonlit.org | Arizona Flip Book <br> http://www.azed.gov/azccrs/fil | multiple choice assessments |
| value and the properties of |  | es/2013/11/2flipbookedited.pd | (8.2.2.E.1) |
| operations. (Explanations may |  | $\underline{1}$ | - Performance Task |
| be supported by drawings or objects.) |  | Delaware DOE Common | Alternative Assessments: |
|  |  | Core Item Bank for | Online |
| 2.MD.B.6. Represent whole |  | Mathematics - Grade 2 | assessments: |
| numbers as lengths from 0 on a |  | http://www.doe.k12.de.us/cms | https://www.opene |
| number line diagram with |  | /lib09/DE01922744/Centricity | d.com/search?area |
| equally spaced points |  | /Domain/111/Math_Grade_2- | d.com/searci.area |
| corresponding to the numbers $0,1,2, \ldots$, and represent |  | Nov.pdf | $\begin{aligned} & =\text { mathematics\&gra } \\ & \text { de=2\&resource_ty } \end{aligned}$ |
| whole-number sums and |  | Worksheets, games, lesson | pe=assessment |
| differences within 100 on a number line diagram. |  | plans: <br> https://www.education.com/re | (CRP2, CRP4, CRP8) |
|  |  | sources/second-grade/math/ | - Learning centers: |
| 2.0A.A.1. Use addition and |  | (8.1.2.E.1) | each learning |
| subtraction within 100 to solve |  |  | center focuses on a |
| problems involving situations |  | Worksheets, games, videos: | different type of |
| of adding to, taking from, |  | http://www.mathchimp.com/2 | problem |
| putting together, taking apart, |  | nd-grade-math-resources | (8.2.2.E.1) |
| and comparing, with unknowns in all positions, e.g., |  | (8.1.2.E.1) | Graphs, charts, diagrams |
| by using drawings and |  | www.khanacademy.org |  |
| equations with a symbol for the |  | (8.1.2.E.1) |  |
| unknown number to represent |  |  |  |
| the problem. (See Table 1.) |  | Activities, worksheets, lesson plans, curriculum: |  |
| 2.OA.B.2. Fluently add and |  | http://www.jumpstart.com/pa |  |
| subtract within 20 using |  | rents/resources/grade-based- |  |
| mental strategies. By end of |  | resources/2nd-grade- |  |
| Grade 2, know from memory |  | resources |  |
| all sums of two one-digit numbers. (See standard 1.OA. 6 |  | (8.1.2.E.1) |  |
| for a list of mental strategies.) |  | Everyday math resources: |  |

\(\left.$$
\begin{array}{ll}\hline \begin{array}{l}\text { Mathematical Practices } \\
\text { MP.1, MP.3, MP.4, MP.5, } \\
\text { MP.6 }\end{array} & \begin{array}{l}\underline{\text { http://www1.center.k12.mo.us }} \\
\text { ledtech/edm/2.htm } \\
\text { (8.1.2.E.1) }\end{array} \\
\begin{array}{l}\text { Explanation of math } \\
\text { journals: } \\
\text { https://hecornerstoneforteac }\end{array} \\
\hline \begin{array}{l}\text { hers.com/math-journals/ }\end{array}
$$ <br>

(CRP4, NJSLSA.W2)\end{array}\right\}\)| Math journals: |
| :--- |
| https://www.k- |

## Key Vocabulary:

Chapter 4 -
join, set, take away, compare
Chapter 7 -
Meter stick, length, meter(m), width, length, taller, tallest, shorter, shortest, longer, longest, centimeter(cm)
Chapter 10 -
Sum, add mentally, difference, subtract mentally, number line, about

## NJ Learning Standards Vocabulary:

2.NBT.B.5, 6, 7 \& 9

Use place value understanding and properties of operations to add and subtract.
fluent, compose, decompose, place value, digit, ten more, ten less, one hundred more, one hundred less, add, subtract, sum, equal, addition, subtraction

## 2.MD.B. 5 \& 6

Relate addition and subtraction to length.
inch, foot, yard, centimeter, meter, ruler, yardstick, meter stick, measuring tape, estimate, length, equation, number line, equally spaced, point, addition, subtraction, unknown, sums, differences, measure, standard units, customary, metric, units, sums, differences

## 2.OA.A. 1

Represent and solve problems involving addition and subtraction.
add, subtract, more, less, equal, equation, putting together, taking from, taking apart, addend, comparing, unknown

## 2.OA.B. 2

Add and subtract within 20.
add, subtract, sum, more, less, equal, equation, putting together, taking from, taking apart, addend

## Accommodations and Modifications:

Students with special needs: Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered. Additional staff should be included so all students can fully participate in the standards associated with this curriculum.

ELL/ESL students: Students will be supported according to the recommendations for "can do's" as outlined by WIDA https://www.wida.us/standards/CAN DOs/

Students at risk of school failure: Formative and summative data will be used to monitor student success at first signs of failure. Student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations. More time will be made available with a certified instructor to aid students in reaching the standards.

Gifted and Talented Students: Students excelling in mastery of standards will be challenged with complex, high level challenges.

## English Language Learners:

- Teaching modeling
- Peer modeling
- Word walls
- Give directions in small steps and in as few words as possible
- Provide visual aids
- Group similar problems together
- Repeat directions when necessary


## Special Education:

- Utilize modifications \& accommodations delineated in the students' IEP
- Work with paraprofessional
- Work with a partner
- Shorten assignments to focus on mastery or key concepts
- Maintain adequate space between desks
- Keep workspaces clear of unrelated materials
- Provide fewer problems to attain passing grades
- Tape a number line to the student's desk


## At-Risk:

- Use visual demonstrations, illustrations and models
- Give directions / instructions verbally and in simple written format
- Peer support
- Increased one - on - one time
- Teachers may modify instructions by modeling what the student is expected to do
- Instructions may be printed out in large print and hung up for the students to see during the time of the


## Gifted and Talented:

- Inquiry based instruction
- Independent study
- Higher order thinking skills
- Adjusting the pace of the lessons
- Real world scenarios
- Student driven instruction

|  | - Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments <br> - Provide extra time to complete a task when needed <br> - Provide definitions of different graphs / charts with illustrations | lesson <br> - Review behavior expectations and made adjustments <br> - Create a math journal that they can use during class, on assignments and (if teacher allows) on assessments |  |
| :---: | :---: | :---: | :---: |
| Interdisciplinary Connections: ELA <br> NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. <br> RI.2.3. Describe the connection between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text. <br> RI.2.7. Explain how specific illustrations and images (e.g., a diagram showing how a machine works) contribute to and clarify a text <br> NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content <br> SL.2.3. Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue <br> SL.2.6. Produce complete sentences when appropriate to task and situation in order to provide requested detail or clarification <br> NJSLSA.L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking |  |  |  |
| Integration of Technology Standards NJSLS: <br> 8.1.2.E.1: Use digital tools and online resources to explore a problem or issue <br> 8.2.2.E.1: List and demonstrate the steps to an everyday task. |  |  |  |
| Career Ready Practices: <br> CRP2: Apply appropriate academic and technical skills <br> CRP4: Communicate clearly and effectively and with reason <br> CRP6: Demonstrate creativity and innovation <br> CRP8: Utilize critical thinking to make sense of problems and persevere in solving them |  |  |  |
| 21st Century Standards |  |  |  |

9.1.4.A.1 Explain the difference between a career and a job, and identify various jobs in the community and the related earnings.
9.1.4.A. 2 Identify potential sources of income.

Major Supporting Additional (Identified by PARCC Model Content Frameworks)

