



# ThinkUp!<sup>TM</sup> MATH

to support instruction for  
**NCSCOS**

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# How to Use ThinkUp! Math for Core Content

Updated June 2020

If you plan to implement **ThinkUp! Math as core content** to support NCSCOS instruction, these resources are a valuable starting point. Here you will find sample lesson plans as well as ideas for integrating ThinkUp! Math into your school's instructional plan.

Find more [resources and downloadables](#) to help with your implementation plan.

## Our Approach

ThinkUp! Math provides rigorous content that is both research-based and fully aligned to the NCSCOS. Research tells us that student outcomes improve when students learn to think critically, and then learn how to connect that thinking to learning. Each unit in ThinkUp! Math closely follows this research, equipping teachers to facilitate critical thinking development, connect that thinking to learning, and help students master learning targets.

As former classroom teachers, we share your goal to equip students to think critically and master the content so they are prepared for high-stakes testing, the next grade level, and a career beyond high school. Thank you for allowing Mentoring Minds to partner with you on this educational journey. You are the reason we do what we do!

## Math Lesson Plans for Core Content

Use these lesson plan guides as a starting point if you plan to use ThinkUp! Math as core content in your classroom. These plans are designed to guide instruction as students master a new concept over the course of five lessons.

The location for each suggested ThinkUp! Math unit component is noted as either **Student Edition (SE)** or **Teacher Edition (TE)**.

## Before You Begin

1. Use the Table of Contents (TE) to determine which unit aligns to the desired NCSCoS for Mathematics.
2. Read Clarifying the Standards (TE) for background information and instructional context.
3. Read the Focus for the 9 Traits of Critical Thinking (TE) to become familiar with the two critical thinking traits for the unit. This will empower you as a teacher to push students to think critically.
4. Administer the Pre-Assessment found in the [on our website](#). This will give you valuable information on what pre-requisite skills your students are weak in. This will help you gauge the level of support students will need during the unit.
5. Display the Learning Targets (TE) in your room to help students focus on what they are trying to accomplish in this unit.
6. View Home Connection (TE) activities at the end of the unit. These are activities that parents can do with their children to support the concepts that they are learning in your classroom. Many teachers choose to put these activities in a newsletter or post them on their website.

## Lesson 1

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Focus: Introduce the Concept(s)

*Time: 60 mins*

1. Introduce the Learning Targets (SE) to students. (5 minutes)
2. Have students complete the Focus for the 9 Traits of Critical Thinking (SE) to become familiar with the focus critical thinking traits for the unit and debrief. (10 minutes)
3. Use the Concept Exploration (TE) for an interactive, hands-on scaffolding activity to introduce the concept(s). Have students complete the corresponding Concept Exploration page (SE). (15 minutes)
4. Introduce unit vocabulary in Vocabulary Mastery (TE) using the whole group activity. (10 minutes)
5. Assess student learning using the Formative Assessment (TE) for the Concept Exploration activity. Monitor student responses/discussions and adjust the next day's instruction as needed. (10 minutes)
6. Have students complete an exit ticket as a closure activity: Share one true statement as it relates to the lesson objective. Based on today's lesson, students will probably share a vocabulary term or a conclusion they made from the Concept Exploration. (10 minutes)

## Lesson 2

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Focus: Build Vocabulary and Reinforce Learning

*Time: 60 mins*

1. Choose one of the titles from the [Literature Connection](#) (TE) and read aloud so that students make explicit connections to the Learning Targets (SE). (10 minutes)
2. Revisit vocabulary terms using the Vocabulary Mastery (SE) and have students complete the page. Building academic vocabulary is crucial to concept mastery. (15 minutes)
3. Choose a hands-on instructional activity from the Concept Development (TE) for students to complete. Most instructional activities require manipulatives or preparation, so make sure to review the materials needed. Monitor students during the activity to formulate next instructional steps. (25 minutes)
4. Have students complete the Concept Development (SE) using the examples given. If needed, students can take this page home to complete. This is a great homework assignment because it provides an explanation for guardians. (10 minutes)

## Lesson 3

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Focus: Engage Students in the Learning

*Time: 60 mins*

1. Review the Concept Development (SE). (10 minutes)
  2. Have students highlight the Learning Targets (SE) that they feel they have mastered. This will give them a chance to reflect and track their own progress through the unit. (5 minutes)
  3. Choose an instructional activity from Concept Development (TE) to complete with students. (25 minutes)
  4. Assess student learning using the Formative Assessment (TE) for the Concept Development activity. (10 minutes)
  5. Have students independently complete Concept Application (SE). They can take it home for homework if not finished, then bring back the next day to debrief. (10 minutes)
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## Lesson 4

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### Focus: Master the Concepts

*Time: 60 mins*

1. Debrief the Concept Application (SE) that students completed the day before by using the Concept Application/Concept Practice (TE). As teachers, we should move beyond just handing students the correct answer, instead walk them through the process we use to get there. Concept Application/Concept Practice (TE) provides a script of questions you can use to debrief the items which will make this a reflective activity for your students. (10 minutes)
2. Have students complete Concept Practice (SE). (20 minutes)
3. Assign Motivation Station (SE). This is a culminating activity that tests students' skills and gives them an opportunity to process what they have learned. (20 minutes)
  - While students work to complete Motivation Station (SE), this would be a great time to work with students in a small group that need some intervention support. Find activities to use for intervention in Concept Development (TE) or Intervention (TE).
4. Close the session by asking your students to reflect on their thinking. Go to Focus for the 9 Traits of Critical Thinking (TE) and choose some of the questioning prompts for students to reflect on. Have students answer the question prompts with a think-pair-share, by writing responses in their math journal, on an exit ticket, or as a whole class discussion. Choose the system that works best for your class. (10 minutes)

## Lesson 5

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### Focus: Differentiate and Review

*Time: 60 mins*

1. Have students complete Concept Check (SE).
2. Once students have completed the assessment, have them begin the Math Challenge (SE). (5 minutes)
3. Lead the entire class in the Reflect on My Learning (SE) activity. (10 minutes)
4. Identify students in need of further concept instruction. Use an Intervention Activity (TE) to scaffold instruction of the standard(s). For the rest of the class, assign Extending Student Thinking (TE) to differentiate further learning.
5. Use observations made during re-teaching or extensions to assess student progress. Option: Assess student learning using the Formative Assessment (TE) for the Intervention activities. (5 minutes)
6. Reflecting is one of the 9 Critical Thing Traits™. It is important to show value to this trait by making it important throughout the entire learning experience. Model reflection with your students by using Reflection on My Learning (SE) and Reflection on Critical Thinking (SE). While they are reflecting, it is important to complete Teacher Reflection (TE). Debrief with other teachers and ask for their input on your reflections. (5 minutes)

# How to Use ThinkUp! for Math for Intervention

Updated May 2020

If you plan to implement **ThinkUp! Math as intervention content** to support NCSCoS instruction, the following resources are a valuable starting point. Here you will find sample lesson plans that are designed to guide intervention instruction for a small group of students or whole class that have not mastered a previously covered concept.

Find more [resources and downloadables](#) to help with your implementation plan.

## Our Approach

ThinkUp! Math provides rigorous content that is both research-based and fully aligned to the NCSCoS. Research tells us that student outcomes improve when students learn to think critically, and then learn how to connect that thinking to learning. Each unit in ThinkUp! Math closely follows this research, equipping teachers to facilitate critical thinking development using the 9 Traits of Critical Thinking™ to master learning targets.

As former classroom teachers, we share your goal to equip students to think critically and master the content so they are prepared for high-stakes testing, the next grade level, and a career beyond high school. Thank you for allowing Mentoring Minds to partner with you on this educational journey. You are the reason we do what we do!

## Math Lesson Plans for Intervention

Use these example lesson plans as a starting point if you plan to use ThinkUp! Math as intervention content in your classroom. The plans are designed to provide fully-aligned, standards-based instruction to guide students to mastery of each concept over the course of five lessons.

For each suggested ThinkUp! Math unit component, its location is noted as either **Student Edition (SE)** or **Teacher Edition (TE)**

## Before You Begin

1. Use the Table of Contents (TE) to determine which unit aligns to the desired NCSCoS for Mathematics.
2. Read Clarifying the Standards (TE) for background information and instructional context.

## Lesson 1

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Focus: Introduce the Concept(s)

*Time: 60 mins*

1. Have students complete the Concept Exploration (SE). This will allow the students the opportunity to think through and explore a concept.
2. While students are exploring, facilitate academic conversation using questions and instructional examples from Concept Exploration (TE).
3. Assess student learning using the Formative Assessment (TE) for the Concept Exploration activity.

## Lesson 2

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Focus: Build Vocabulary

*Time: 30 mins*

1. Sometime students understand the arithmetic involved in solving a problem, but they do not understand the vocabulary associated with the mathematical concept. Student that do not grasp the mathematical vocabulary struggle to solve word problems or answer questions. By reinforcing the students' academic vocabulary, you are helping them strengthen their math skills. Discuss unit/standard vocabulary found both in the (TE) and (SE).
2. Complete the Vocabulary Mastery (TE) to build further understanding of unit vocabulary.
3. Have students complete Vocabulary Mastery (SE) for additional practice and to demonstrate their comprehension of the vocabulary.
4. End with the Formative Assessment (TE) for the Vocabulary Mastery activity.

## Lesson 3

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Focus: Intervention Activities

*Time: 45 mins*

1. Support the unit concept with an instructional activity from Concept Development (TE) or Intervention (TE). Monitor students during the activity to observe, identify, and correct any misconceptions about the concept.
2. Assign the Concept Development (SE), which gives the students a worked-out example on the page, so that students will have a model to follow when they try it on their own.
3. Have students examine Concept Application and Concept Practice (SE) problems and cross out an answer choice that is incorrect. Then have them justify why they crossed it out. This is a great exercise that challenges students to think deeply about the concept while reinforcing a great test-taking strategy.
4. Have students complete Concept Application (SE) and Concept Practice (SE).
5. Review data from Concept Application (SE) and Concept Practice (SE) to identify areas that need reinforcement or extension.

## Lesson 4

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### Focus: Master the Concepts

*Time: 45 mins*

1. Support learning with an instructional activity from Concept Development (TE) that has not yet been utilized.
2. Monitor students during the activity to observe, identify, and correct any misconceptions about the concept.
3. Assign Concept Check (SE) in print edition or online to take advantage of the progress monitoring feature.
4. Use the assessment data to identify students in need of further instruction or who would benefit from extension of the concept.
5. Promote mastery by assigning an error analysis. Post a representative problem from the unit with an incorrect solution or process. Have students determine, discuss, and correct the error. Share results.

## Lesson 5

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### Focus: Review and Reinforce

*Time: 30 mins*

1. Identify students that have mastered the concept and have them complete Math Challenge (SE).
2. Identify students in need of further concept instruction. Use an additional Intervention (TE) activity to further scaffold instruction of the standard(s).
3. Assign Motivation Station (SE) to differentiate and further student learning.
4. Use observations made during re-teaching or extensions to assess student progress. Option: Assess student learning using the Formative Assessment (TE) for the Intervention activity.
5. Have students complete Reflection on My Learning (SE) and Reflection on Critical Thinking (SE).



# How to Use ThinkUp! for Math for Supplemental Content

## Suggestions for Integrating ThinkUp!

Matching instructional materials is simple if you are using ThinkUp! Math to supplement other classroom resources. Many components can easily be combined to create *'zero additional minutes'* time during your instructional day. These components are shown with an (\*).

### Steps:

1. Use the **Table of Contents** in your ThinkUp! Math Teacher Edition to match each unit's Focus NCSCoS with your district Year at a Glance or Scope and Sequence documents.
2. Use the table below to help you locate matching routines between ThinkUp! Math and other resources used for mathematics instruction.

ThinkUp! Component	May Match With:	Possible Solution to Create ' <i>Zero Additional Minutes</i> ' Time
<b>*Pre-Assessment</b>	Pre-Assessment	Use the ThinkUp! Math <b>Pre-Assessment</b> or consider selecting a bank of questions from both materials if available.
<b>*Learning Target</b>	Key Concept, Essential Question, Target Skill, Introduce the Concept, Student Learning Goals	Use the <b>Learning Targets</b> component during the introduction of the NCSCoS for Mathematics focus alongside other instructional materials.
<b>Critical Thinking Traits Formative Assessment</b>	none	This time should be added after the introduction of the <b>Learning Targets</b> to help students connect their learning to the <b>9 Traits of Critical Thinking</b> .
<b>*Concept Exploration</b>	Introduction Activity, Warm-up	This allows students the opportunity to be inquirers and for them to discover mathematical concepts through exploration. Use <b>Concept Exploration</b> as an introductory activity before jumping into other instructional materials.
<b>*Vocabulary Mastery</b>	Expand Vocabulary, Academic Vocabulary, Vocabulary List	Mastering academic vocabulary is essential for students to be able to read and understand word problems. The <b>Vocabulary Mastery</b> in each unit identifies words that are associated with the focus NCSCoS and provides instructional activities to support instruction. Choose an activity from your available options.
<b>Literature Connection</b>	none	Use the <b>Literature Connection</b> to reinforce the concept vocabulary. Most of these books can be found in your school library.

ThinkUp! Component

May Match With:

Possible Solution to Create '*Zero Additional Minutes*' Time

<b>* Concept Development</b>	Instructional Activities, Whole Class Instruction, Small Group Instruction	The <b>Concept Development</b> provides a menu of instructional activities that are teacher-facilitated to help students understand the concept. Compare this list of activities with the activities that are provided in your core curriculum and use the ThinkUp! activities to help build a stronger lesson. These activities can be done in any order. Remember that this is a menu, so choose the activities that will help create a well-balanced lesson.
<b>* Concept Development</b>	Examples, Classwork, Homework, "I Try, You Try"	<b>Concept Development</b> can be used as homework because it provides examples of the process and then asks students to complete similar problems. Pages are perforated, so they can be torn out and combined with homework assignment pages from other instructional materials.
<b>*Concept Application &amp; Concept Practice</b>	Test-Prep, Homework, Classwork,	<b>Concept Application</b> and <b>Concept Practice</b> are formatted like an end of year assessment for student practice. <b>Concept Application/Concept Practice</b> provides a script on how to debrief the items with students for deeper understanding.
<b>*Motivation Station</b>	Centers, Partner Work	The <b>Motivation Station</b> activity is hands-on and typically requires manipulatives to complete. This is something that can be added to a math center or can be used as partner practice. Use with center ideas provided in other instructional materials.
<b>*Concept Check</b>	Quiz, Assessment, Unit Test, Chapter Test, Benchmark	<b>Concept Check</b> can be used as a quiz after covering the content in your core curriculum or it can be combined with another assessment to create a unit test.
<b>* Intervention</b>	Small Group Instruction, Reteach, RTI, Tier 2 or Tier 3 Instruction	Choose either the <b>Intervention</b> activities from your ThinkUp! Math materials or activities from other instructional materials if provided.
<b>*Math Challenge</b>	Math Challenge, Warm-up, Exit Ticket, Reflection	Use the <b>Math Challenge</b> along with other instructional materials to challenge students to extend their critical thinking and problem-solving skills. This section ends with reflection questions, which would make for a great exit ticket.
<b>*Extending Student Thinking</b>	Extension, Project-Based Learning	The <b>Extended Student Thinking</b> section provides a project-based activity that will allow students to apply what they have learned to create something new, which is the highest level of Bloom's Taxonomy. This is a great way to end any unit.
<b>*Home Connection</b>	Parent Involvement, Family Connection	Use the ideas from <b>Home Connection</b> with suggestions from other instructional materials to share with parents and caregivers through classroom newsletters or digital communication apps.