Adapted to STEMAZing ECE Format by
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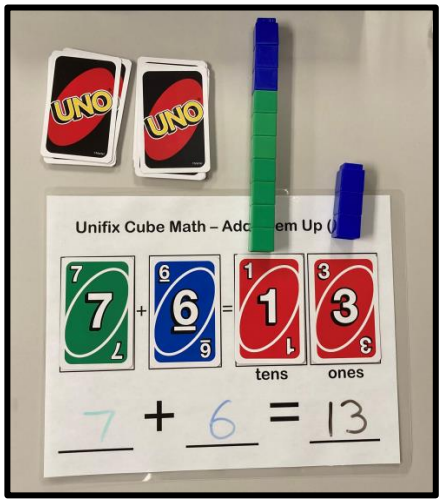
Uno, Dos, Tres - Unifix Cube Patterns and Math



NOTE: Children should always be given ample time to experiment, notice, and wonder before they are provided an explanation.

Always engage children with our two favorite questions:

What do you notice?

What do you wonder?

Resist the urge to answer any questions children have while exploring. Instead, respond back with questions to children and let them make sense of the world. Sample questions you might use: What do you think? Do you notice any patterns? What could we change? Can we test something else? What can we try next? If children ask a testable question, which they could answer by doing an experiment, talk through with them how they might design a test to help answer their question. As much as possible and within reason, let them test their questions by trying the experiments they propose.

Learning Objectives

Children will…

- create patterns.
- apply one-to-one correspondence counting.
- demonstrate adding numbers with cards and cubes.
- break total tower of cubes down into towers of tens and single cubes – ones.

Vocabulary (See **What the heck? Explanation of Math** at the end for definitions.)

Pattern	Digit	Double Digits
Addition	Tens	Single Digit
Sum	Ones	

Materials

Unifix Cubes	Laminated Unifix Cube Patterns Mats	Laminated Unifix Cube Math Mat
Uno Cards		
Dry Erase Markers	Laminated Build the Number Mats	Unifix Cube Number Line

Key Questions

What is the pattern? What is the number? What do the numbers add up to?

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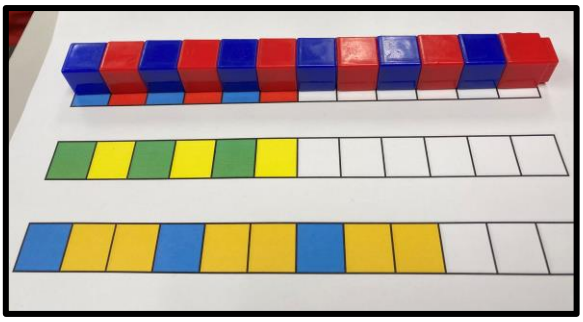
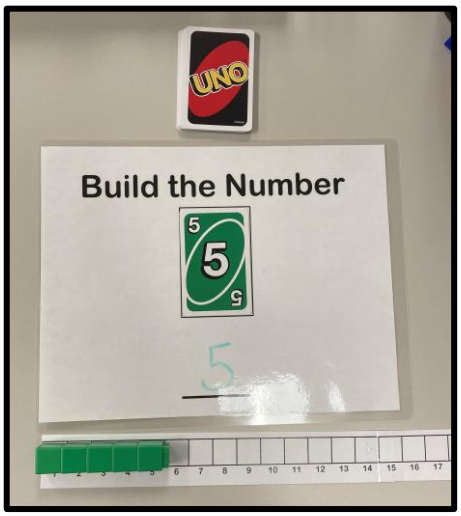
Notice and Wonder Developmentally Appropriate Practice

Patterns



1. Use the Unifix Cube Patterns – What comes next? Mat and have the children use the Unifix Cubes to build and complete the pattern.
2. Next, use the Unifix Cube Patterns – Build Your Own Mat and have the children create their own patterns.
    - Remember, a pattern needs to repeat at least three times before children will recognize its structure and be able to extend it.

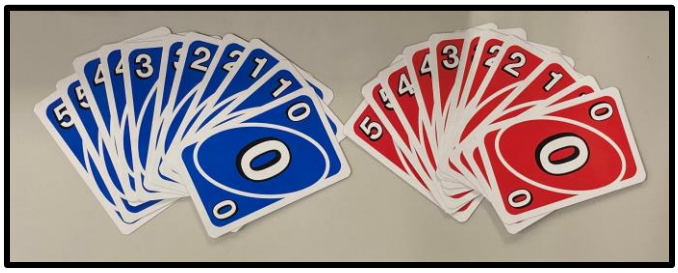
Build the Number – Single Digits



1. Use the Build the Number Mat with one box. Flip an Uno card face up onto the box.
2. Either you or the child should write the number from the Uno card on the line below it.
3. Ask the child to build a tower with the same number of cubes. (Example: If the number is a 5, then the child should make a tower using 5 Unifix cubes. Even better if the color of the cubes can match the color of the Uno card.)
4. This can also be done in reverse. Children can be given a tower of cubes, count them, and then find the matching Uno card.
5. Answers can be verified using the Unifix Cube Number Line.
6. Repeat!

Unifix Cube Math – Add Them Up (0-5)

NOTE: The 0-5 cards are used to keep the sum at or below 10. If they happen to get two fives, celebrate that they need two cards to represent their sum – a 1-0 for ten.



1. Separate out the 0-5 cards and separate them by color. You will need three colored stacks for this activity.
2. Place two of the colored stacks above the mat leaving the duplicate numbers in them. The cards in each stack should be shuffled and placed face down – one stack above each empty box, as shown on the next page.

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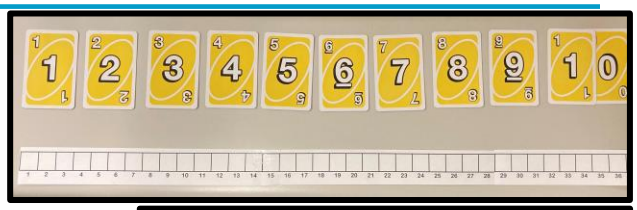
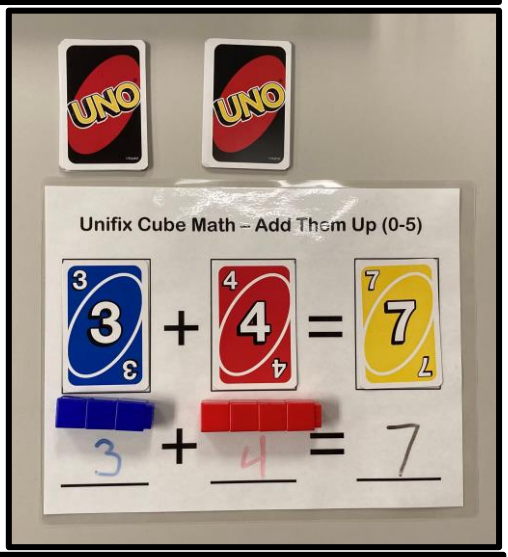
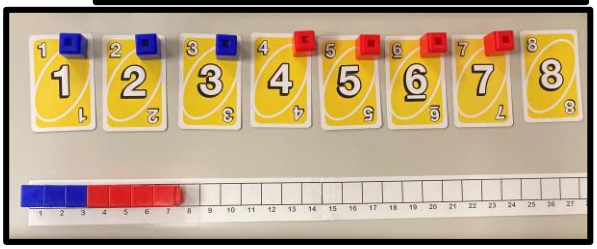


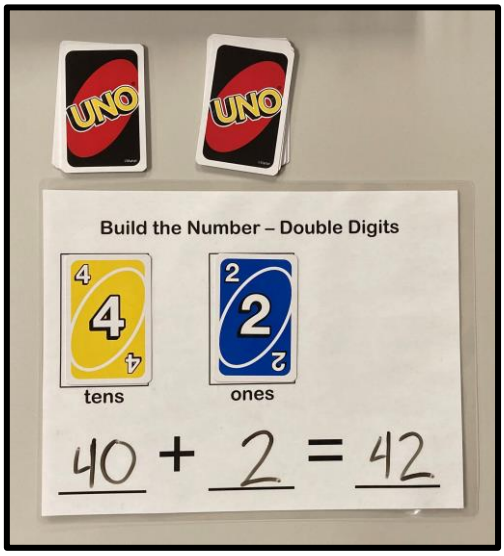
3. Take the third colored stack and create the numbers 0-10 on the right side of the mat. You can also use the Unifix Number Line with this activity.
4. Flip a card over into the first box from the stack above it.
5. Either you or the child should write the number on the line below the card.
6. Flip a card over into the second box from the stack above it.
7. Either you or the child should write the number on the line below the card.
8. Have children build the two numbers with Unifix cubes. (If they can match the color of the cards, all the better.)
9. Children should then combine the two towers and count the total number of cubes.
10. Children should find the Uno card from the number line to the right of the mat and put it in the box with the question mark.
    - For younger children, you could have them put a Unifix cube on each card starting with 1 to figure out how many total cubes they have.
11. The sum can also be verified using the Unifix Cube Number Line.
12. Repeat!





Build the Number – Double Digits

1. Next use the Build the Number – Double Digits Mat for children who recognize number 10 and higher.
2. Separate out 0-9 cards, with duplicates. You will need two colored stack for this activity.
    - For younger children, you can simply only 1s and 2s for the tens place stack. For older children, use all the cards from 0-9 in each stack.
3. Flip over an Uno card face up for the tens place and for the ones place. Either you or the child should write the numbers below the tens and ones place. (Note that you write 40 under the tens because 4 tens is actually 40.)



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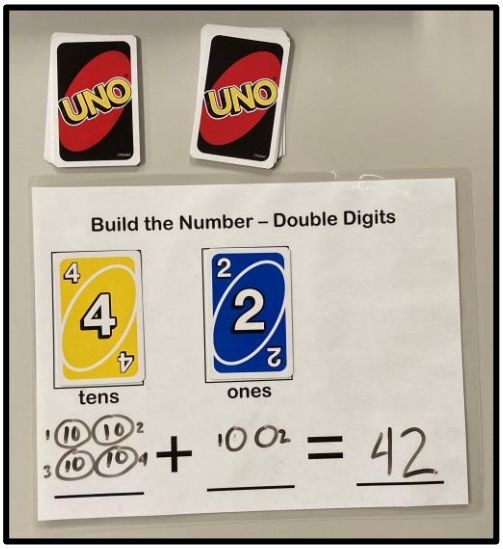
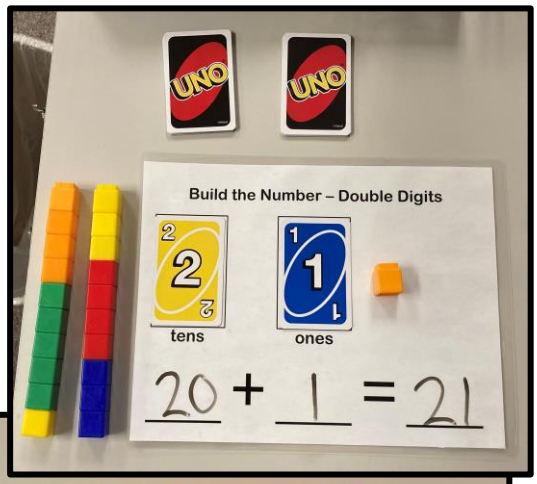
- For the tens place, you might start by writing the actual number of tens out on the line. For example, if the Uno card is 4 in the tens place and 2 in the ones place, you would write 10, 10, 10, 10 under the tens card and 2 under the ones card. They would then build four towers of 10 cubes and one tower of 2 cubes. They could then put all the cubes in a single tower and count them. As children progress, they can write 40 under the tens place instead of four tens. They should not be allowed to write just a 4 on the line under the tens place though. A four in the tens place means 4 ten towers which is 40!



4. Answers can be verified using the Unifix Cube Number Line.
5. Repeat!

Build the Number – Double Digits in Reverse

1. Children are given a tower of cubes, which is more than ten cubes total.
2. Children should count off towers of ten and separate them from the tower until they have less than ten left.
3. Children should then put the towers of ten by the tens place and the remaining cubes by the ones place.
4. They can now write the number of ones left and the number of cubes by the tens place (not a single digit but a double digit – either 10, 20, 30, … etc.)
5. They should now write the double-digit number and find the Uno cards to match.
    - For example, if they were given a tower of 21 cubes total, they would have taken off two towers of ten and has one cube left over. This is 20 + 1 which is 21.
6. Children can reassemble the total tower and check their answer against the Unifix Cube Number Line.
7. Repeat!



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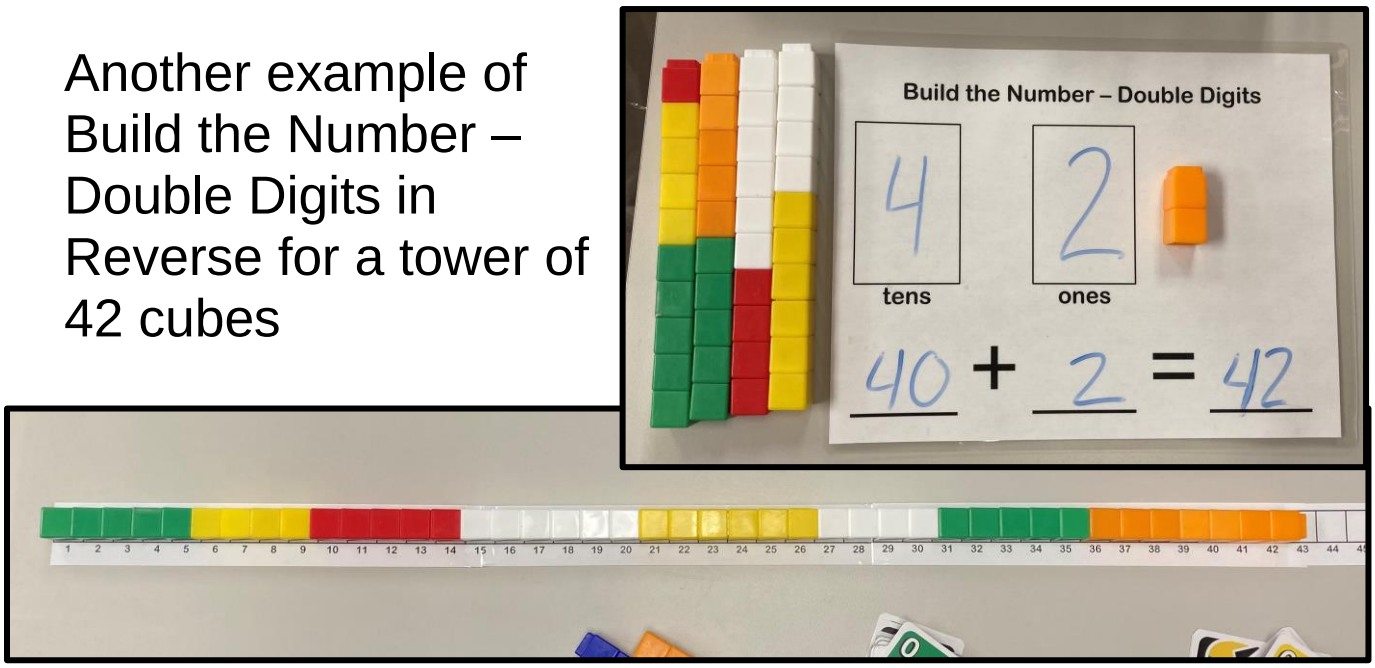
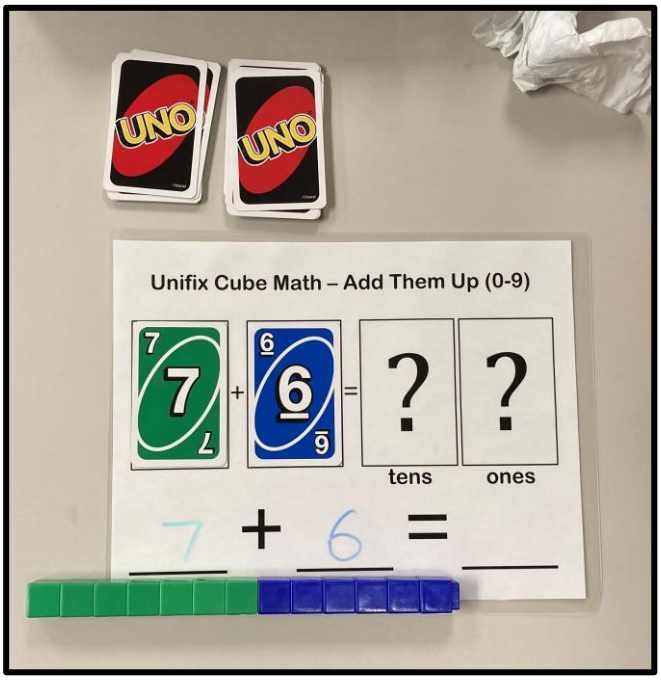
Another example of Build the Number – Double Digits in Reverse for a tower of 42 cubes



Unifix Cube Math – Add Them Up (0-9)

1. Separate out the 0-9 cards and separate them by color. You will need three colored stacks for this activity.
2. Place two of the colored stacks, shuffled, above the mat and the third one to the right leaving the duplicate numbers in all of them.
3. Flip a card over into the first box from the stack above it.
4. Either you or the child should write the number on the line below the card.
5. Flip a card over into the second box from the stack above it.
6. Either you or the child should write the number on the line below the card.
7. Have children build the two numbers with the same colored cubes as the cards.



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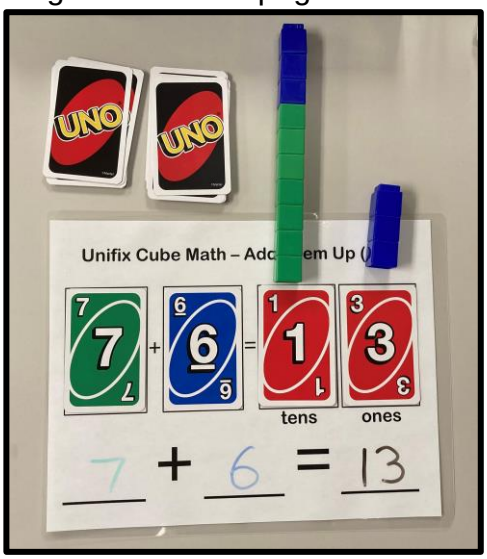
8. Children should then combine the two towers and count the total number of cubes. They can then find the digits they need from the third colored stack and place those cards on the ?? boxes, as shown in the image on the next page.
    - If the count goes above ten, children should separate the tower of ten from their total tower. Then, they you can explain how they have one ten and so many ones left. For example, if they turned a 6 and a 7 over, they would build a total tower of 13. If they count off a tower of ten, they have one tower of ten and three single cubes left over. So, they put a 1 in the tens place and a 3 in the ones place.
9. Children can reassemble the total tower and check their answer against the number line.
10. Repeat!



Unifix Cube Math – Break Them Down

NOTE: Children could do this activity in reverse. You could give them a tower of 19 or less cubes. They could then break it apart into two towers wherever they would like, count the cubes in each tower, and find the Uno cards to match those two numbers. You could give them ten cubes and challenge them to figure out all the combinations that might add up to ten. How many different ways can they split the tower into two?

Children should notice…

- patterns repeat themselves and can be extended.
- they can represent numbers with cubes and cubes with numbers.
- by counting the total tower of cubes, they are able to add the two numbers together and come up with the sum.
- that by counting the Unifix cubes they are able to add the cards and come up with the sum.

Extensions for Additional Learning

As always, ask the children throughout the experiment what they notice and what they wonder. If their wonder questions are testable, as much as possible and within reason, let them test their questions by trying new experiments.

See below for examples of what they might wonder and experiments they might do to test their wonderings.

- I wonder if I can add three numbers? Or four numbers? Or five numbers?
- I wonder how many Unifix cubes I have?
- I wonder how many towers of ten I can have?
    - Let them try it!

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#STEMAZingPictureBook Recommendations:

Quack and Count by Keith Baker

Connections to the activity:

Use Unifix cubes as a non-standard measurement.

Graph with Unifix cubes.

Differentiating Developmentally Appropriate Practice

Discussed in Notice and Wonder section. The order of the activities is from lowest to higher level complexity.

AZ Early Learning Standards

Math Standard- Strand 1: Counting & Cardinality

Concept 4: Counts to Tell Number of Objects: The child uses number words and counting to identify quantity

Math Standard- Strand 2: Operations & Algebraic Thinking Concept 1: Explores Addition and Subtraction: The child recognizes addition as adding to and subtraction as taking away from.

Math Standard - Strand 2: Operations & Algebraic Thinking- Concept 2: Patterning: The child recognizes, fixes, duplicates, extends, describes, and creates patterns.

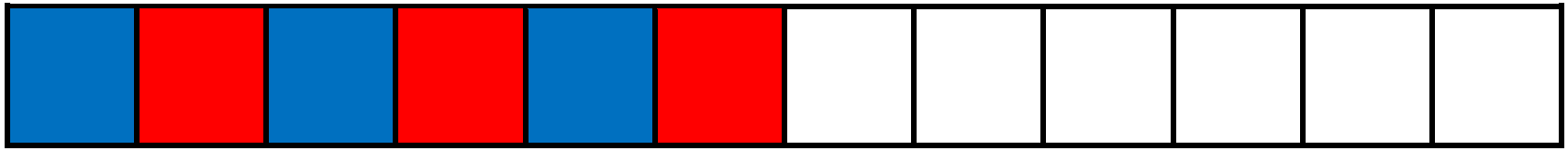
Math Standard - Strand 3: Measurement & Data - Concept 1: Sorts & Classifies: The child sorts and groups objects by a variety of attributes.

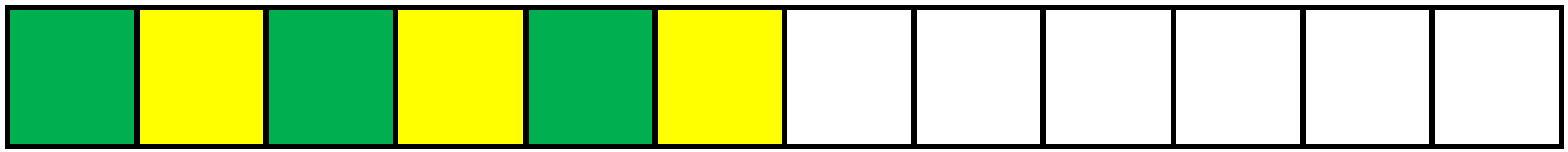
Unifix Cube Math

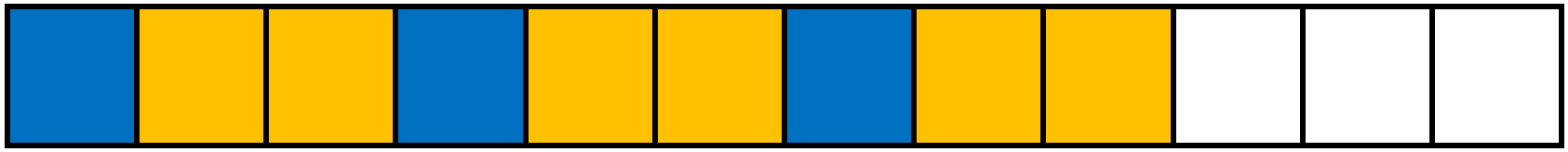
What the heck? Explanation of the Math (Vocabulary in bold.)

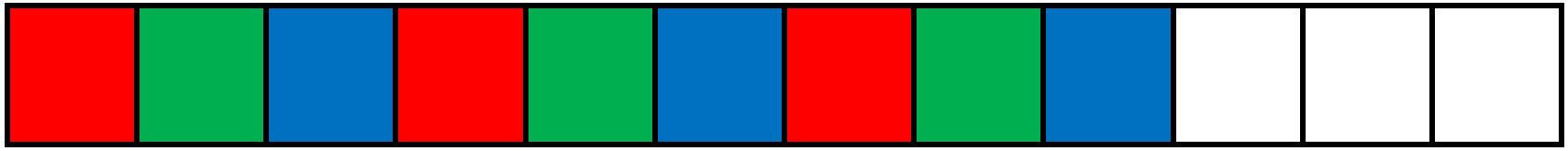
Patterns are regular or repetitive arrangements of objects, sounds, or movements. The single numbers 0-9 are known as **digits**. These represent all of the symbols we use in the base 10 system we use most frequently. **Single-digit** numbers use only the **ones** place in positional notation and the digits 0-9. The ones place in the first position in the base ten system. Once you count past 9, you need add a second position to the left of the ones position. This position is called the **tens** place and now **double-digit** numbers or numbers using two positions can be represented. Each position can use the digits 0-9 in the base 10 system. The digit in the tens position represents the number of tens in the number. Again, it is important to note that a 6 in the tens place actually represents 60 and not just 6, in terms of value. **Addition** is finding the total, or **sum**, by combining two or more numbers.

Unifix Cube Patterns – What comes next?

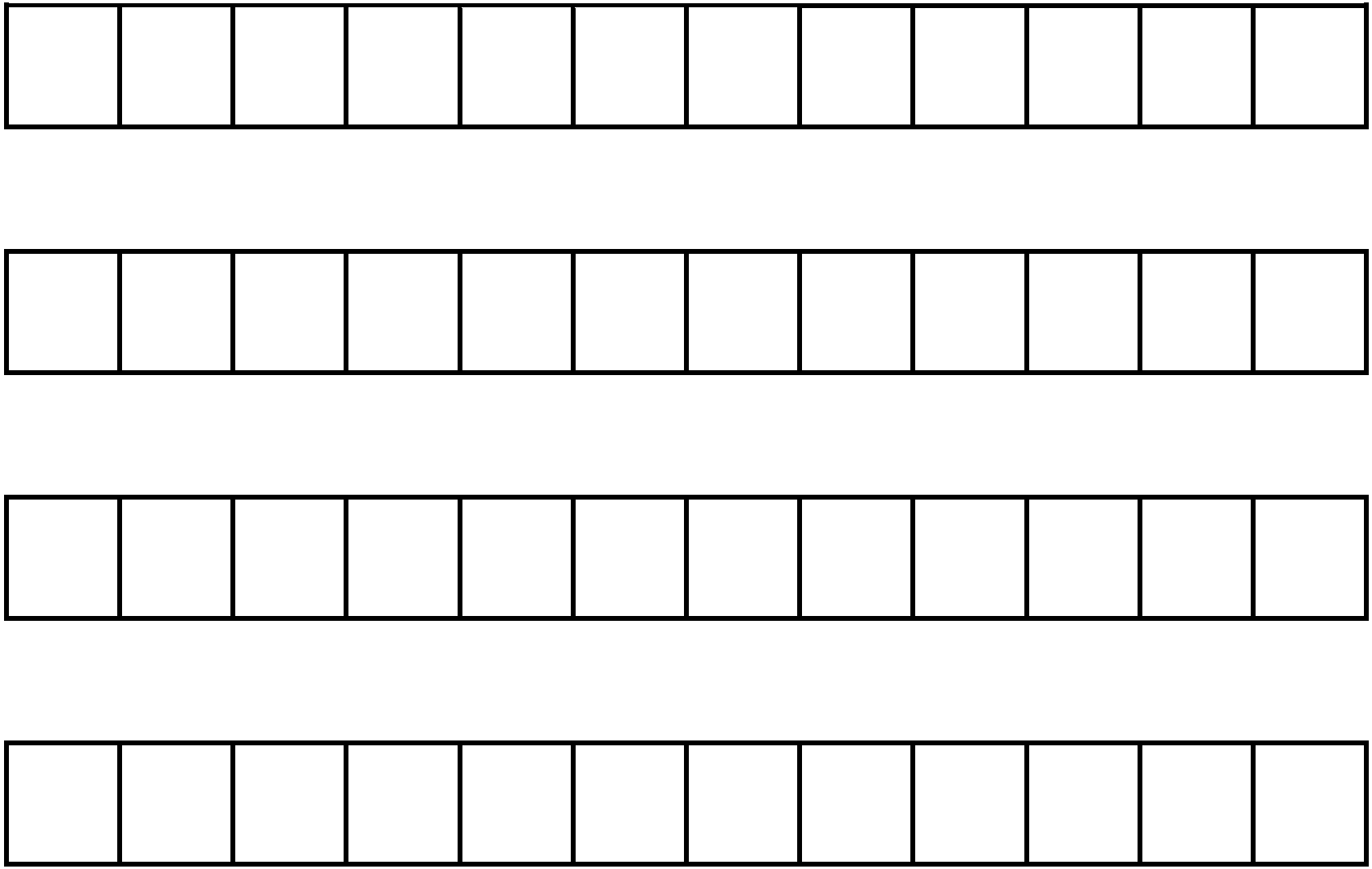




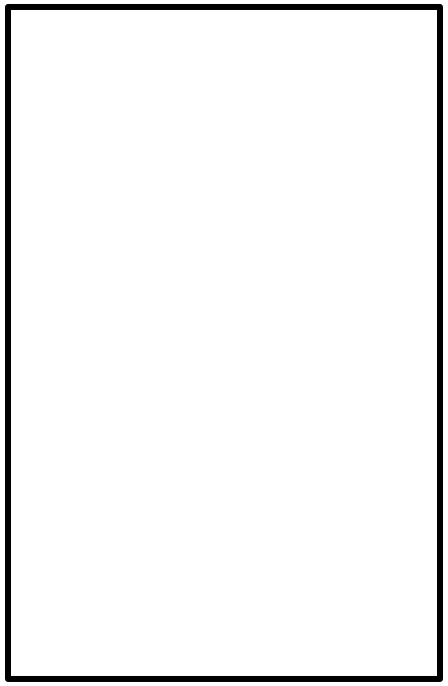




Unifix Cube Patterns – Build Your Own

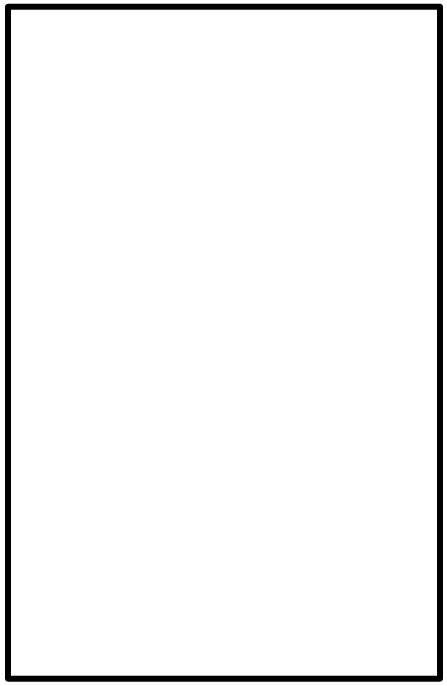


Build the Number

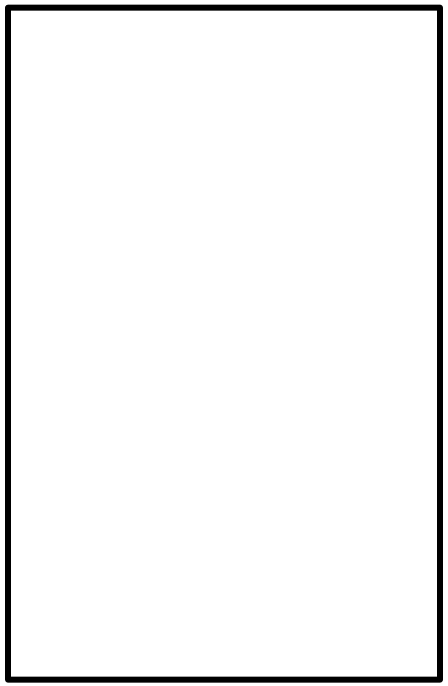


ones

Build the Number – Double Digits



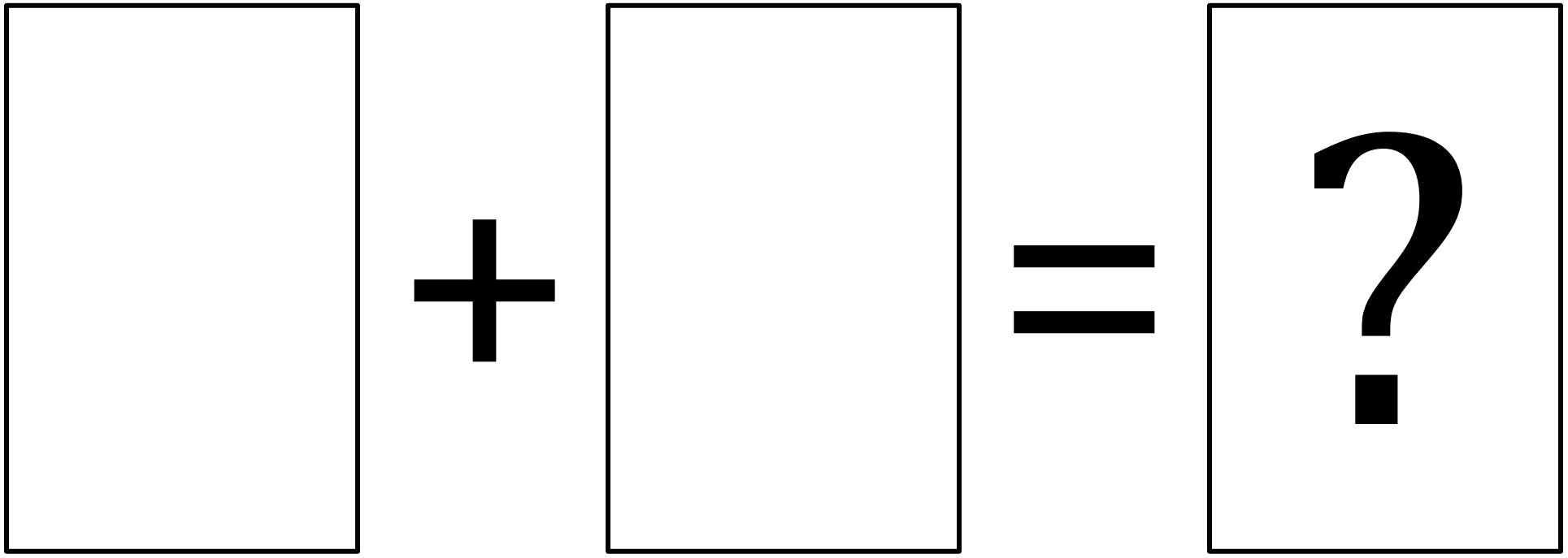
tens



ones

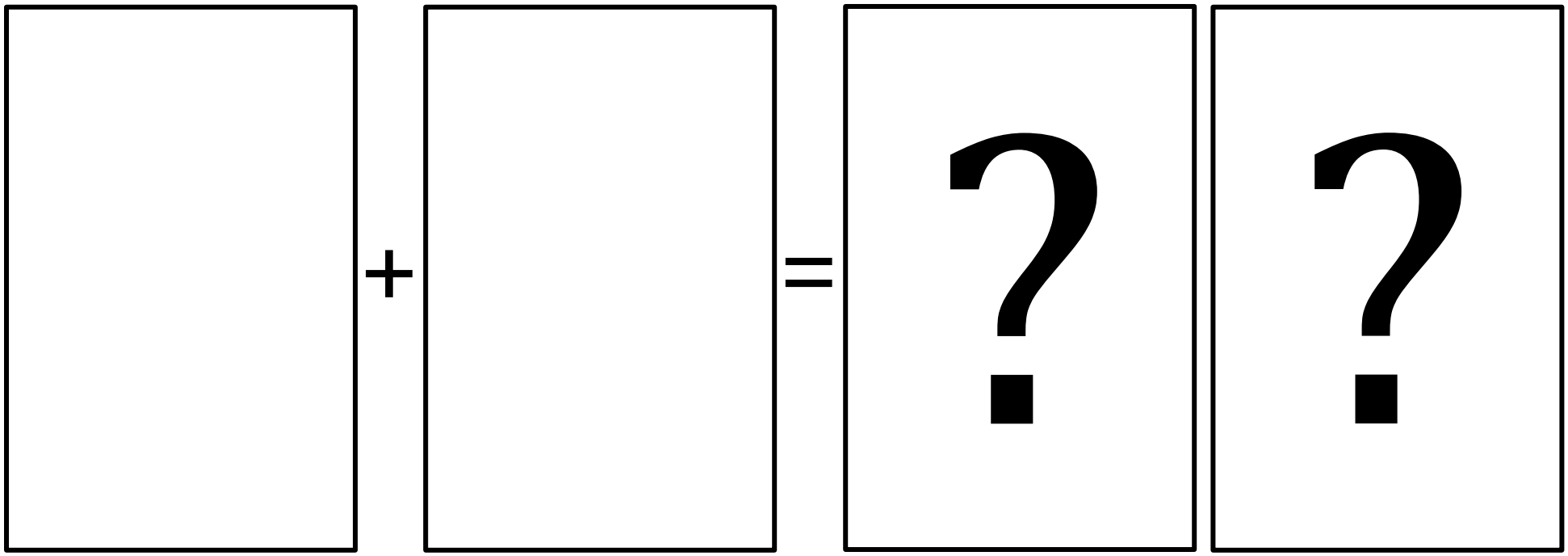
_____ + _____ = _____

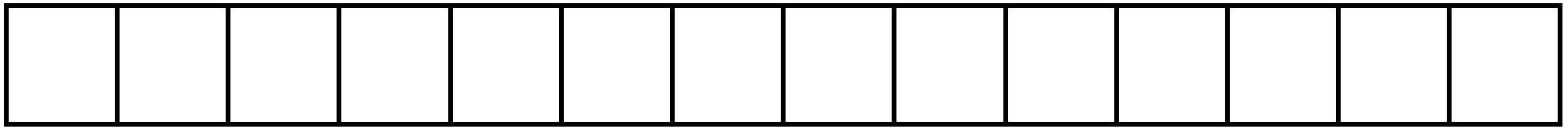
Unifix Cube Math – Add Them Up (0-5)

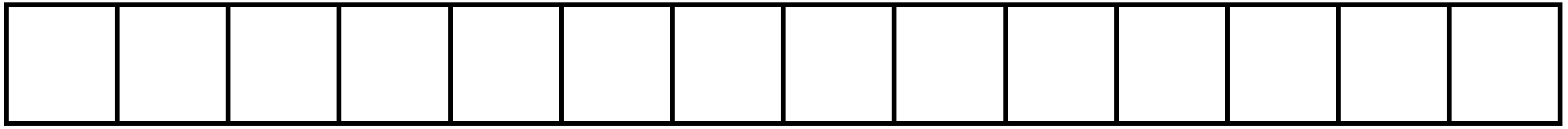


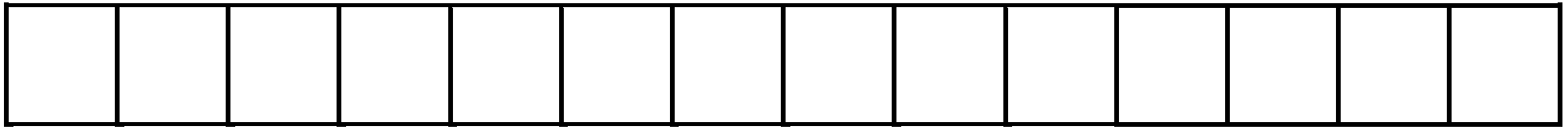
_____ + _____ = _____

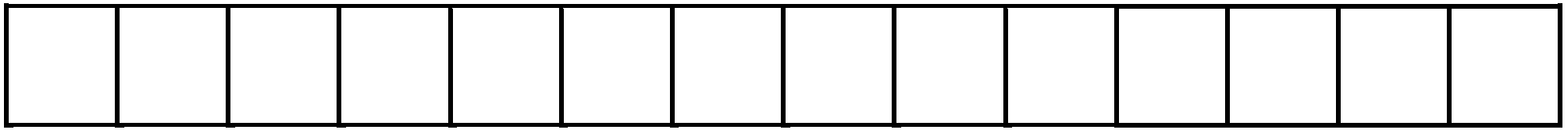
Unifix Cube Math – Add Them Up (0-9)

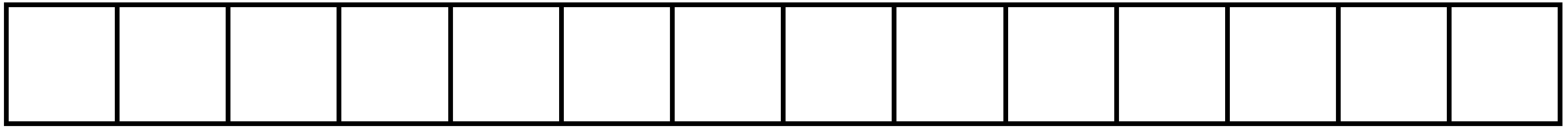












71	72	73	74	75	76	77	78	79	80	81	82	83	84

85	86	87	88	89	90	91	92	93	94	95	96	97	98

99	100	101	102	103	104	105	106	107	108	109	110	111	112

113	114	115	116	117	118	119	120	121	122	123	124	125	126

127	128	129	130	131	132	133	134	135	136	137	138	139	140