robo™ wunderkind

Math Projects: Activity Cards

with Robo Wunderkind Robotics Kit

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Project 1: Robo Sends Light Signals

Concepts: Even and Odd Numbers

Complexity: ★☆☆

Robo's Story:

Some robots can speak and some cannot, but there are many different types of communication between robots, such as different light signals, secret codes, or ciphers. Can our Robo speak? Can we teach it to make a cipher using the light signals?

Project goal:

Build a Robo-Encoder and program it to create a light signals cipher.

Project 1: Robo Sends Light Signals

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What is odd or even number?

What is a secret code or a cipher? How do people make or encode a cipher? What does it mean “decode” a cipher?

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1 Program:

= 2,4,6,8,10 seconds. Are these numbers even or odd? Why?

= 1,3,5,7,9 blinks. Are these numbers even or odd? Why?

= only even numbers. Arrange the numbers in **ascending order.**

= only odd numbers. Arrange the numbers in **descending order**.

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2 Encode a message:

Cipher Key

2 Hi!	6 I want to be friends with you!	1 How are you?	5 Do you want to play together?
4 I am Robo!	8 I want to play together!	3 What is your name?	7 What kind of robot are you?
	10 I am a very friendly robot.		9 Do you want to learn math?

Messages

1. Hi! I am Robo! What is your name? →
2. How are you? What is your name? I want to play together! Do you want to learn math? →
3. I am a very friendly robot. I want to be friends with you! Do you want to play together? →
4. I am Robo. I am a very friendly robot. What is your name? What kind of robot are you? →

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3 Create your own cipher.

Project 2: Robo Decodes a Secret Message

Concepts: Addition and/or Subtraction

Complexity: ★☆☆

Robo's Story:

Robo received a cipher – a message from the other robots. There is a key for decoding it but Robo will need our help to do it.

Project goal:

Build a Robo-Decoder and program different Visuals and Sounds using the key in order to decode a cipher-message.

Project 2: Robo Decodes a Secret Message

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What is addition and addition sentence? What is subtraction and subtraction sentence?

What is a secret code or a cipher? How do people make or encode a cipher? What does it mean "decode" a cipher?

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1 Calculate and program a cipher: Number of Blinks Time

1+3 = ◯ **7+1 =** ◯ **10−1 =** ◯ **2−1 =** ◯ **2+3 =** ◯ **4+2 =** ◯ **9−3 =** ◯ **7−4 =** ◯

4 times + 2 times + 1 time + 3 times = ◯◯◯◯

10 sec − 3 sec − 2 sec − 2 sec = ◯◯◯◯

each Action + 2 times = 1◯◯◯◯

each Action − 2 sec = 10◯◯◯◯

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2 Decode a message:

Cipher Key

2 We are friendly robots.	6 Visit us in Robot City!	1 We live in Robot City.	5 Hello Robo!
4 Do you like traveling?	8 Can you drive?	3 Do you want to be our new friend?	7 We want to be your new friends.
	9 Do you know other robots?		9 We hope to see you soon!

Messages

1) 2+3 = ◯ **1+1 =** ◯ **6−5 =** ◯ → ▭ **3) 10−7+1 =** ◯ **3+4−1 =** ◯ **10−1−1 =** ◯ → ▭

2) 3+4 = ◯ **10−7 =** ◯ **3+3 =** ◯ → ▭ **4) 2+2−2 =** ◯ **1+1+8 =** ◯ **5−1+5 =** ◯ → ▭

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3 Create your own message.

Project 3: Robo Decodes a Secret Map

Concepts: Multiplication

Complexity: ★★☆

Robo's Story:

Robo received a secret message from the other robots – it's a map to Robot City. It is written in a special cipher and Robo needs to decode it.

Project goal:

Build a Robo-vehicle and code different Movements to decode the secret map.

Project 3: Robo Decodes a Secret Map

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What is multiplication and multiplication sentence?

What is a secret code or a secret map? How do people make or encode a cipher? What does it mean to "decode" a map?

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1 Calculate and program: Distance Angle

3×5 = ◯ **5×5 =** ◯ **5×6 =** ◯ **7×5 =** ◯

7×10 = ◯ **10×3 =** ◯ **10×9 =** ◯ **10×10 =** ◯

→ **Connect** all Movement Actions into one code.

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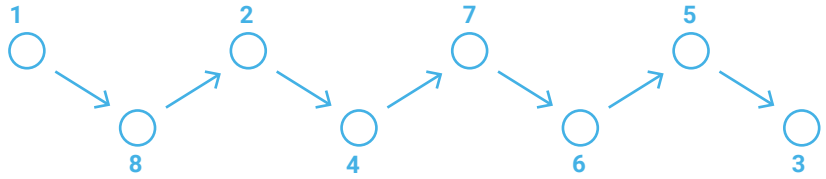
2 Decode a map:

7×5 = ◯ 1 **10×6 =** ◯ 2 **5×8 =** ◯ 5 **9×5 =** ◯ 6

5×4 = ◯ 3 **9×10 =** ◯ 4 **11×10 =** ◯ 7 **10×7 =** ◯ 8



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3 Create your own message.

Project 4: Robo Travels to Robot City

Concepts: Division

Complexity: ★★☆

Robo's Story:

Last time Robo decoded a secret map. Now it is ready to travel to Robot City and meet other robots.

Project goal:

Build a Robo-traveller and code different Movement to travel to Robot City.

Project 4: Robo Travels to Robot City

What is division and division sentence?

What is a secret code or a secret map? How do people make or decode a secret map? What does it mean to "decode" a map?

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1 Calculate and program: Distance Angle

8÷2 = ◯ **180÷3 =** ◯ **90÷3 =** ◯ **280÷4 =** ◯

100÷25 = ◯ **1200÷60 =** ◯ **180÷2 =** ◯ **6000÷20 =** ◯

→ **Connect** all Movement Actions into one code.

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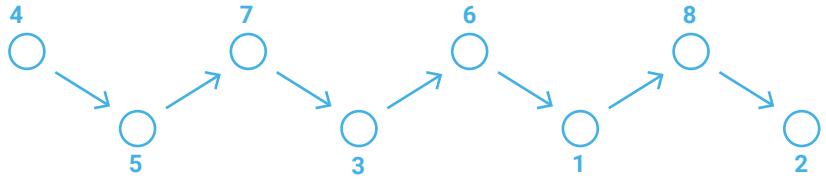
2 Decode a map:

70÷2 = ◯ 1 **1400÷20 =** ◯ 2 **80÷8 =** ◯ 5 **1800÷30 =** ◯ 6

100÷4 = ◯ 3 **9000÷100 =** ◯ 4 **90÷2 =** ◯ 7 **1000÷10 =** ◯ 8



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3 Create your own secret map.

Project 5: Robo in Robot City Communicates with Other Robots

Concepts: Addition, Subtraction, Multiplication, Division

Complexity: ★★★

Robo's Story:

Robo arrives in Robot City, ready to meet other robots. It will need to make different light signals, sounds, and movements to decode and encode ciphers and communicate with other robots.

Project goal:

Build a Robo-creature and code different Movement, Visuals, and Sounds to encode and decode different messages in order to communicate with other robots.

Project 5: Robo in Robot City Communicates with Other Robots

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What is Addition, Subtraction, Multiplication, Division?

Can robots speak to each other? How can robots communicate? What is a secret code? What does it mean to decode a secret code or a message?

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1 Calculate and program: Ordinal Number · Lifespan · Distance · Angle

Ordinal Number	Lifespan	Distance	Angle
3+4 = ◯	2×2 = ◯	7+1 = ◯	3×3 = ◯
15−6 = ◯	15÷5 = ◯	18−17 = ◯	45/7 = ◯

Distance	Angle
50+30 = ◯	11×5 = ◯
100−40 = ◯	90÷9 = ◯

Angle	
10+60 = ◯	10×10 = ◯
90−75 = ◯	150÷3 = ◯

→ **Connect** all Actions into one code.

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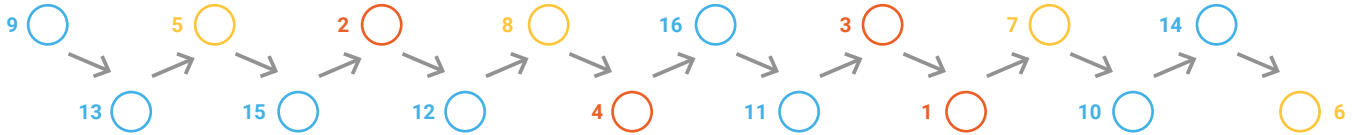
2 Solve all challenges and complete Robo's Cipher

6+1 = ◯ 1	6+4−1 = ◯ 5	90−5−5 = ◯ 9	50+20+20 = ◯ 13
10−5 = ◯ 2	3−2+6 = ◯ 6	45+5+25 = ◯ 10	300−40+20 = ◯ 14
1×1 = ◯ 3	2×2×2 = ◯ 7	4×5×2 = ◯ 11	12÷2×10 = ◯ 15
16÷2 = ◯ 4	90÷3÷10 = ◯ 8	600÷3÷2 = ◯ 12	150×2÷3 = ◯ 16



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3 Create your own Robot City and challenges for Robo.