

# Automated Packaging Challenge 6DMM

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

STUDENT #: \_\_\_\_\_ TEACHER: \_\_\_\_\_

## Candy Sort Data Collection Sheet—Page 1

Write the steps of your procedure below.

Step 1: \_\_\_\_\_

Step 2: \_\_\_\_\_

Step 3: \_\_\_\_\_

Step 4: \_\_\_\_\_

Step 5: \_\_\_\_\_

How much time was required to complete the procedure? (in seconds): \_\_\_\_\_

| Data Table #1:<br>Number of seconds required for each<br>team to package their bags |  |  |  |
|---|--|--|--|
|   |  |  |  |
|   |  |  |  |
|   |  |  |  |

### Data Analysis: Data Ordering Box

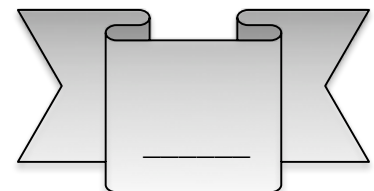
| Number of seconds required for packaging bags<br>Ordered from smallest number to largest number |   |   |   |   |   |   |   |   |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|
| 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |

Median time: \_\_\_\_\_

Lower Quartile (Q1): \_\_\_\_\_

Upper Quartile (Q3): \_\_\_\_\_

- If your speed was Q1 or lower, you get **1 point**
- If your speed was between Q1 and Q3, you get **2 points**
- If your speed was Q3 or higher, you get **3 points**



Number of points earned  
for speed

## Candy Sort Data Collection Sheet—Page 2

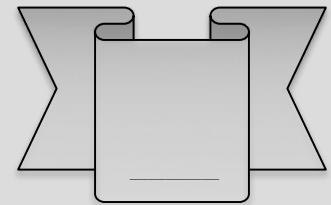
| Data Table #2:<br>Numbers of each color candy in each bag |        |        |        |        |
|---|--------|--------|--------|--------|
| Color Candy   | Bag #1 | Bag #2 | Bag #3 | Bag #4 |
| Blue  |        |        |        |        |
| Pink  |        |        |        |        |
| Purple  |        |        |        |        |
| Yellow  |        |        |        |        |
| Total number in bag                                       |        |        |        |        |

### Bag Size

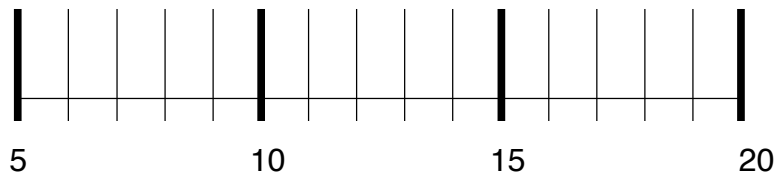
Range in total number of candies in bags  
(Maximum—Minimum)

\_\_\_\_\_

Range= 0-2            3 points  
 Range= 3-8            2 points  
 Range= > 8            1 point



Number of points earned for range in candy number



**Dot Plot:**  
Number of individual color candy in bag

### Data Ordering Box

| Number of individual color candy in bag<br>Ordered from smallest number to largest number |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |
|---|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|
| 1   | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

### Analysis of color distribution data from Data Table #2

Median: \_\_\_\_\_ Minimum: \_\_\_\_\_ Maximum: \_\_\_\_\_

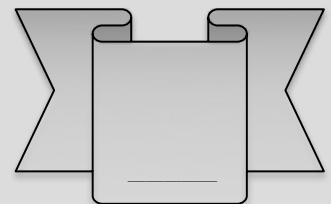
Q1: \_\_\_\_\_ Range: \_\_\_\_\_

Q3: \_\_\_\_\_ Interquartile Range: \_\_\_\_\_

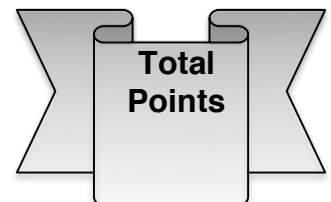
### Color Consistency

Interquartile Range (IR)  
(Q3-Q1)

IR= 0-3            3 points  
 IR= 4-8            2 points  
 IR= > 8            1 point



Number of points earned for consistency



**Total Points**

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## Box and Whisker (Box Plot) Sheet

### Analysis of color distribution data from Data Table #2

Median: \_\_\_\_\_ Minimum: \_\_\_\_\_ Maximum: \_\_\_\_\_

Q1: \_\_\_\_\_

Q3: \_\_\_\_\_

Draw a box and whisker plot on the number line below using the five-number summary from your candy sort.



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## Packaging Company Machines Specifications

### Company #1: Robotic Machines, Inc. Specifications

Maximum # of one color: 18

Minimum # of one color: 6

Median # of each color: 12

Q1: 9

Q3: 15

Minimum # of candies per bag: 47

Maximum # of candies per bag: 49

Bags packaged per minute: 90

Cost for the machine: \$65,000

Draw the box and whisker plot below.

Color Consistency  
Interquartile Range: \_\_\_\_\_

Bag Size Range: \_\_\_\_\_

### Company #2: Quick Machine, Inc. Specifications

Maximum # of one color: 28

Minimum # of one color: 4

Median # of each color: 16

Q1: 8

Q3: 25

Minimum # of candies per bag: 42

Maximum # of candies per bag: 56

Bags packaged per minute: 100

Cost for the machine: \$40,000

Draw the box and whisker plot below.

Color Consistency  
Interquartile Range: \_\_\_\_\_

Bag Size Range: \_\_\_\_\_

## Packaging Company Machines Specifications

### Company #3: Packaging 'R Us Specifications

Maximum # of one color: 13

Minimum # of one color: 10

Median # of each color: 12

Q1: 11

Q3: 12

Minimum # of candies per bag: 48

Maximum # of candies per bag: 48

Bags packaged per minute: 36

Cost for the machine: \$18,500

Draw the box and whisker plot below.

Color Consistency  
Interquartile Range: \_\_\_\_\_

Bag Size Range: \_\_\_\_\_

### Company #4: Machine Depot Specifications

Maximum # of one color: 26

Minimum # of one color: 3

Median # of each color: 14

Q1: 7

Q3: 20

Minimum # of candies per bag: 43

Maximum # of candies per bag: 53

Bags packaged per minute: 56

Cost for the machine: \$45,000

Draw the box and whisker plot below.

Color Consistency  
Interquartile Range: \_\_\_\_\_

Bag Size Range: \_\_\_\_\_

# Automated Packaging Challenge 6DMM

**NAME:** \_\_\_\_\_ **DATE:** \_\_\_\_\_

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## Decision Matrix

|   | <b>Company #1</b>                 | <b>Company #2</b>               | <b>Company #3</b>          | <b>Company #4</b>        |
|---|-----------------------------------|---------------------------------|----------------------------|--------------------------|
|   | <b>Robotic<br/>Machines, Inc.</b> | <b>Quick<br/>Machines, Inc.</b> | <b>Packaging<br/>'R Us</b> | <b>Machine<br/>Depot</b> |
| Speed: Bags per minute                            |                                   |                                 |                            |                          |
| Accuracy of candy number<br>(Range)               |                                   |                                 |                            |                          |
| Consistency of color mix<br>(Interquartile Range) |                                   |                                 |                            |                          |
| Price of machine (\$)                             |                                   |                                 |                            |                          |

### Rules for color shading

**Speed:**            Greater than 75—color green  
                           Between 50 and 75—color yellow  
                           50 or less—color red

**Range:**            0-2—color green  
                           3-8—color yellow  
                           Larger than 8—color red

**Interquartile  
range:**            0-3—color green  
                           4-8—color yellow  
                           Larger than 8—color red

**Cost:**             Less than \$25,000—color green  
                           Between \$25,000 and \$50,000—color yellow  
                           Larger than \$50,000—color red

NAME: \_\_\_\_\_ DATE: \_\_\_\_\_

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## Pitch Planning

The following questions should be considered as you plan a pitch to investors.

Which machine are you planning to buy?

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Why is this particular decision right based on the evidence?

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How much money do you need?

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Why should an investor loan money to you and your candy factory?

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