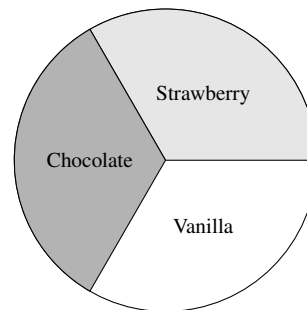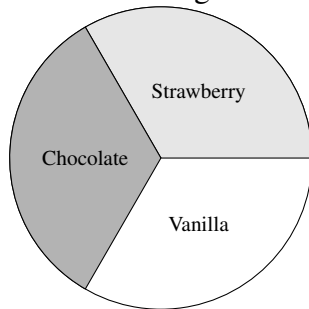Goal: Review Divider-Chooser, Introduce Lone-Divider

1. Recall from the previous worksheet: Tom and Fred were given a cake worth $12 that is equal parts strawberry, vanilla and chocolate, their respective values summarized in the chart.
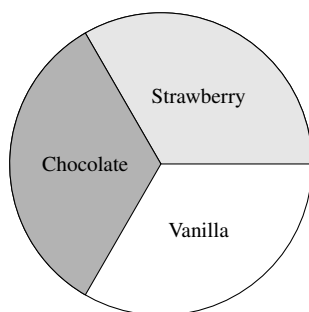
	vanilla	strawberry	chocolate
Tom	$ 6	$ 6	$ 0
Fred	$ 2	$ 4	$ 6

(a) Divide the cake using Divider-Choose assuming Tom is the divider. Determine the **value** of the assigned share to each party.

(b) Divide the cake using Divider-Choose assuming Fred is the divider. Determine the **value** of the assigned share to each party.

2. Is it better to be the Divider or the Chooser? Why?

3. Lone-Divider Method (for N people for $N \geq 3$).

    0. Arbitrarily pick a Divider.

    1. The Divider divides the items into N shares of equal value to them: $s_1, s_2, \cdots, s_N$.

    2. The remaining parties **declare** or **bid** on which the shares, $s_1, s_2, \cdots, s_N$, they consider fair.

    3.   i. **IF** the N shares can be divided among the parties such that each gets a fair share, then do so.

        ii. **IF NOT**, then give the Divider a **non-contested piece**. Then restart Lone-Divider with $N - 1$ parties and recombine the shares.

4. **Example 1** Suppose Patrick, Chris, and Travis are splitting a pile of football memorabilia estimated to be worth $300. It has been split into 3 shares and their respective values are summarized in the table.

	s_1	s_2	s_3
Patrick	$50	$150	$100
Chris	$70	$70	$160
Travis	$100	$100	$100

(a) Circle or highlight each individual's **bid** (the shares they would considered fair).

(b) Determine which person was the Divider.

(c) Determine the next steps of the Lone-Divider Method.

5. **Example 2** Suppose Patrick, Chris, and Travis are splitting a pile of football memorabilia estimated to be worth $300. It has been split into 3 shares and their respective values are summarized in the table.

	s_1	s_2	s_3
Patrick	$100	$100	$100
Chris	$90	$40	$170
Travis	$50	$90	$160

(a) Circle or highlight each individual's **bid** (the shares they would considered fair).

(b) Determine which person was the Divider.

(c) Determine the next steps of the Lone-Divider Method.