$\qquad$
Period $\qquad$

## Worksheet - Insertion Sort

You are using the Insertion Sort algorithm on the following array:

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\mathbf{3}$ | $\mathbf{2 6}$ | $\mathbf{1 8}$ | $\mathbf{1}$ | $\mathbf{2 7}$ | $\mathbf{1 0}$ | $\mathbf{3}$ | $\mathbf{4 6}$ | $\mathbf{5}$ | $\mathbf{2}$ | $\mathbf{5}$ |

1) Draw the array after the first pass:

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |

2) Draw the array after the second pass:

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |

3) Draw the array after the third pass:

4) Draw the array after the fourth pass:

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |

5) Draw the array after the fifth pass:

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |  |  |  |

6) In general, how many passes does selection sort take to guarantee that the correct value is in the first position?
7) What is the complexity of insertion sort?
8) After iteration $n$, what are we guaranteed?
9) What are we not guaranteed until the end of the last iteration?
