



Title: Particulates & Population Zoom In Inquiry
Teacher Sheet

Instructions: Your teacher will display images for the class to observe. With each image, there will be a question. As you observe the images, follow the steps below:

- 1) **Think:** On the chart below, jot down a response to the question that is posted. (1 min)
- 2) **Pair:** Talk with your partner about your response to the question that is posted. (1 min.)
 - Respond with follow-up questions:
 - What makes you say that?
- 3) **Share:** Your teacher will call on 2-3 students to share out. (1 min.)

<p>1. <i>Expected student responses:</i></p> <ul style="list-style-type: none"> • Circles that are different sizes • Mostly blue/ turquoise circles but some dark blue and orange circles • A lot of circles in the Northeast of the United States and the Southwest. 	<p>2. <i>Expected student responses:</i></p> <ul style="list-style-type: none"> • Orange and blue/ turquoise circles on South America • Some big circles and a lot of small dots • Some dots are spread out while some circles overlap one another 	<p>3. <i>Expected student responses:</i></p> <ul style="list-style-type: none"> • Circles could represent cities. • Circles could represent sites of contamination • Circles could represent windiest regions because many are located close to the ocean.
<p>4. <i>Expected student responses:</i></p> <ul style="list-style-type: none"> • The map creator wanted to show where there are places in the world with a lot of people. • Circles on a map can be easier to understand than a lot of numbers. 	<p>5. The data was collected between 2000-2019.</p> <p><i>Expected student responses:</i></p> <ul style="list-style-type: none"> • The map creator used orange/red to show areas where the PM_{2.5} per person increased and blue/ purple to show where it decreased from 2000-2019. 	<p>6. <i>Possible student responses:</i></p> <p>Air quality has improved the most in West Africa, Mexico, parts of East Asia, Europe and the United States.</p> <p>Air quality has worsened in India, Australia, Northeast Asia among other places.</p>



<p>7. <i>Expected student responses:</i></p> <ul style="list-style-type: none">• There are two large urban areas in South Africa with over 5 million people where PM_{2.5} concentrations have decreased. Near those areas, there are dozens of urban areas with 2.5 million people or less where PM_{2.5} has slightly increased or decreased. There is also one area with between 2.5 and 5 million people where particle pollution worsened.	<p>8. <i>Expected student responses:</i></p> <ul style="list-style-type: none">• I would like to show this map to policy makers at the United Nations. I would like them to see how much particle pollution worsened in India from 2000-2019 so that they can develop a global solution to this problem.	<p>9. <i>Answers will vary.</i></p> <p>[Extension] <i>expected student response:</i></p> <ul style="list-style-type: none">• I would define the exact range in population for each of the circle sizes.• I would consider making the circles smaller in the scale or adding more circle sizes to the scale so they don't overlap as much.
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