

Welcome to Nanoville!

You and your class are the lawmakers for the city of Nanoville. You are trying to decide if you should pass a new law that requires all new cars to be built with nanocomposites, and provide the funding to do so.

Nanoville facts

- Population: 40,000
- Average income: \$40,000 per year
- Main industry: designing and building cars
- Number of cars sold each year: 1000
- Average cost of a car: \$20,000
- Average number of cars per household: 2
- Number of car accidents per year: 200 (that's a LOT for this number of people!)

What are nanocomposites?

- A new type of plastic with nano-sized clay fibers mixed in

Advantages of nanocomposites over regular plastic

- Stronger and more durable
- Lighter and smoother
- More recyclable than regular plastic
- Can use existing plastics factories to make nanocomposites

Disadvantages of nanocomposites

- Can be more expensive than regular plastic, but not always

As you prepare your presentation and participate in the activity, please try to keep the following things in mind:

1. How do the priorities of someone in your role affect how you feel about the advantages and disadvantages of using nanocomposites?
2. How much do you feel you influenced the decision-making process?
3. Did facts or emotion have more impact on your classmates? Or do you feel that they already had their minds made up before the discussion started?
4. How does the decision your class made affect the future of technology like nanocomposites?
5. How does the decision your class made affect the future of ordinary citizens?



Environmentalists

1. A car made with nanocomposites will be lighter than a regular car. Would a lighter car need more or less gasoline to travel the same distance?

More

Less

2. Why? What effect would this have on the environment?

3. Would a lighter car put more or less wear and tear on roads and highways?

More

Less

4. Why? What effect would this have on the environment?

5. If cars made with a nanocomposites last longer, how would that affect landfill space? Why?

6. What other effects on the environment can you think of?



Industry and Local Businesses

1. Cars made with a nanocomposites are more fuel efficient than regular cars (they use less gas) because they are lighter. If people start driving the new cars, will they buy more or less gasoline?

More

Less

2. Why? What does this mean for gas station owners?

3. If cars are lighter, roads will wear down less quickly and need less repair. What does this mean for people who work in the construction industry? Why?

4. Cars made with a nanocomposites may last longer and need to be fixed less often than regular cars. Will car dealerships sell more or fewer cars as a result?

More

Less

5. Why? What does this mean for the car industry in Nanoville?

6. What other effects on industry or local businesses can you think of?



Health and Safety Workers

1. Cars made with nanocomposites are more fuel efficient than regular cars (they use less gas) because they are lighter. Does this mean there will be more or less air pollution?

More

Less

2. Why? What does this mean for the health and safety of the citizens of Nanoville?

3. If there are fewer pollution-related diseases, what does this mean for the cost of health care, insurance, and for the number of doctors and other health care workers needed? Why?

4. If cars made with a nanocomposites are stronger than regular cars, would people be more or less likely to be seriously injured in a car accident?

More

Less

5. Why? What does this mean for the health and safety of the citizens of Nanoville?

6. What other effects on health and safety can you think of?



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Residents

1. Cars made with nanocomposites might cost more than a regular car, but they are stronger, lighter, and use less gas than regular cars. Are the benefits of buying a composite car worth the extra cost?

Yes

No

2. Why or why not? Don't just focus on cost. Try to think in terms of safety, the environment, etc.

3. If people buy fewer cars as a result of the increased cost, will Nanoville produce more or fewer cars?

More

Fewer

4. Why? What effect would this have on the number of jobs available in Nanoville?

5. How would the change in the number of jobs affect the people of Nanoville? Why?

6. What other effects on the people of Nanoville can you think of?



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Nanocomposite Manufacturers

1. As you get better at mass-producing nanocomposites, do you think the cost will go up or down?

Up

Down

2. Why? In some cases, nanocomposites are more expensive than regular plastic. How do you justify this extra cost to the consumers?

3. The features of nanocomposites include extra strength and less weight. How do you think these features will affect a car? Why? Try to think of possible effects on steering, braking, and what might happen in an accident.

4. Nanoville does not currently have a nanocomposite manufacturing industry. Will starting a nanocomposite factory be good or bad for the city?

Good

Bad

5. Why? How might starting a nanocomposite factory affect the city and its people? Consider its effects on the number of jobs, the environment, and any other things you can think of.

6. What other ways might the use of nanocomposites in cars and other materials affect Nanoville and its people?