

Student Name: _____

Form S1: Pre-unit Survey

Please read the following statements. For each item express your level of agreement with the statement by checking the appropriate box. Please pay careful attention to these statements and think carefully before you mark your agreement.

| Start each of the following sentences with the words “In this class...” | Strongly agree | Agree | Not sure | Disagree | Strongly disagree |
|---|----------------|-------|----------|----------|-------------------|
| 1. I focus on technological design | | | | | |
| 2. I use mathematics to support my work on the technology design challenge | | | | | |
| 3. I do science experiments to support my work on the design challenge | | | | | |
| 4. I use web sites to find relevant information | | | | | |
| 5. I communicate my ideas through the use of verbal, written or electronic forms | | | | | |
| 6. I collect and analyze data | | | | | |
| 7. I learn about the cost and benefit of technology | | | | | |
| 8. I work with other students collaboratively | | | | | |
| 9. I have to draw my models to scale | | | | | |
| 10. I'm encouraged to consider the pros and cons of different design alternatives | | | | | |

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Form S2: Pre-test Drying by Design

1. When solving a design problem, the solution is always limited by:
 - (a) web-based information downloading limitations
 - (b) the prescribed approach to the design solution.
 - (c) problem constraints and specifications.
 - (d) the availability of examples of prior solutions.

2. An informed design cycle is a process that:
 - (a) solves design problems in a single cycle without iteration.
 - (b) uses knowledge of mathematics, science and technology to enhance the design solution.
 - (c) uses a series of mathematical formulae to arrive at a single correct solution for the design.
 - (d) relies on a series of trial-and-error problem-solving procedures.

3. You have been asked to conduct a factor investigation before developing your design solution. The factor investigation is intended to:
 - (a) describe how the rate of heat flow affects the surface temperature
 - (b) reveal how the thickness of a foodstuff affects the rate of drying
 - (c) determine which variables affect the efficiency of the design cycle
 - (d) explain the relationship between food spoilage and microbe degradation

4. What is the most important reason to dry food?
 - (a) To reduce its caloric content.
 - (b) To reduce the likelihood of spoilage.
 - (c) To provide astronauts with a convenient food supply.
 - (d) To improve its nutritional value.

5. To ensure effective food dehydration, which condition must be met?
 - (a) The drying rate must be low to allow time for moisture to evaporate.
 - (b) The drying temperature must be kept high to harden the outermost surface.
 - (c) Very humid air must be blown rapidly across the food surface.
 - (d) Temperatures over 200 degrees F must be used to promote thorough evaporation.

6. Assuming all variables are held constant, the rate of drying food of a given thickness is:
 - (a) Asymmetrical
 - (b) Linear.
 - (c) Linear at the beginning, curvilinear at the end.
 - (d) Nonlinear.

7. When light color fruits are cut, they change color, because:
 - (a) the flesh is oxidized
 - (b) the flesh is chemically reduced
 - (c) the flesh ionizes
 - (d) the flesh is alkalized

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8. The appearance of dried light colored fruits can be improved by pre-treating them with:
 - (a) Yeast
 - (b) Warm water
 - (c) Steam
 - (d) Citric acid

9. Why is an electric fan usually helpful in accelerating the food drying process?
 - (a) It decreases the moisture migration inside the food.
 - (b) It increases the temperature of the food surface.
 - (c) It decreases the relative humidity near the food surface.
 - (d) It increases the relative humidity near the food surface.

10. Food dehydration will be best if:
 - (a) the relative humidity of the surrounding air is higher than the air at the food's surface.
 - (b) the relative humidity of the surrounding air is kept between 80%-90%.
 - (c) the relative humidity of the surrounding air is low.
 - (d) the relative humidity of the surrounding air varies with the rate of dehydration.

11. In investigating relationships between drying time and thickness of food slices
 - (a) Drying time is the independent variable and thickness is the dependent variable.
 - (b) Drying time is the dependent variable and thickness is the independent variable.
 - (c) Drying time and thickness are both dependent variables.
 - (d) Drying time and thickness can be both dependent and independent variables.

12. Which of the following statements about bacteria is true?
 - (a) bacteria growth in food increases at a linear rate with respect to time.
 - (b) the vast majority of bacteria are harmful, and we call them pathogens.
 - (c) bacteria grow and multiply best in very hot environments.
 - (d) bacteria are referred as to decomposers and are an important part of the food chain.

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Form S3: Post-unit Survey

Please read the following statements. For each item express your level of agreement with the statement by checking the appropriate box. Please pay careful attention to these statements and think carefully before you mark your agreement.

| Start each of the following sentences with the words “In this class...” | Strongly agree | Agree | Not sure | Disagree | Strongly disagree |
|---|----------------|-------|----------|----------|-------------------|
| 1. I focus on technological design | | | | | |
| 2. I use mathematics to support my work on the technology design challenge | | | | | |
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| 4. I use web sites to find relevant information | | | | | |
| 5. I communicate my ideas through the use of verbal, written or electronic forms | | | | | |
| 6. I collect and analyze data | | | | | |
| 7. I learn about the cost and benefit of technology | | | | | |
| 8. I work with other students collaboratively | | | | | |
| 9. I have to draw my models to scale | | | | | |
| 10. I'm encouraged to consider the pros and cons of different design alternatives | | | | | |
| Your opinion on the unit: | | | | | |
| 11. The module was interesting | | | | | |
| 12. I learned how to better use the Internet | | | | | |
| 13. The module was difficult for me | | | | | |
| 14. The KSBs helped me to better understand the content | | | | | |
| 15. I understand the technology design cycle better than when I began this course | | | | | |
| 16. I would recommend this unit to other students in school | | | | | |

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Form S4: Post-test Drying by Design

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S5: Tell Us What You Think

Name: _____

Class: _____

Gender: _____

Current science class: _____

Current math class: _____

Current technology class: _____

Main language spoken at home: _____

What did you like best about this unit?

What was the most difficult activity in this unit?

What would you recommend be done differently next time?

