

Electronic Field Trip to Toyota

Teacher Materials Packet

Check out our website at <http://www.ket.org/>.

*Sending in the enclosed evaluation form will help us improve
future field trips.*

We will answer select student questions in a follow-up mailing.

KET, The Kentucky Network

Electronic Field Trip to Toyota Program Outline

I. Overview of TMMK - Toyota Motor Manufacturing of Kentucky

- How many people work at TMMK?
- How is TMMK in Georgetown like a city?
- How are work shifts planned with ergonomics in mind?

For reflection.....

How does one company influence employment at other companies even in other states and other countries?

II. Stamping

- What is a die used in automotive manufacturing?
- How do big coils of steel become car parts?

III. Body Weld

- Why are robotics essential to a modern production plant?
- Compare use of machines and people.
- Why are so many welds necessary to build a car?

For reflection.....

How would operating on a pull system (only producing parts and cars on order) influence the way a production plant operates?

IV. Power Train

- What do employees in power train need to know about engines?
- What is *takt* time?

V. Paint

- What is one way Toyota uses leftover paint from the painting process?
- What does *kaizen* mean? How is this concept used at Toyota?

For reflection....

- What Toyota concepts could you apply to your school? How would you implement the idea?
- How are Toyota's problem solving steps similar to steps you've learned at school?

VI. Plastics

- How do plastic beads become plastic parts for cars?

VII. Inspection

- How is the *andon* cord used throughout the plant and in final inspection?
- What is expected on the job at TMMK?
- What qualities are important in getting a job at TMMK? Why?
- What education is required at TMMK?
- What is rare about Toyota making the Sienna mini-van in Georgetown?

For reflection...

- How would you design cars to be safer than they are?
- How do you think automotive plants will change in the future?

Scavenger Hunt

I. Overview of TMMK - Toyota Motor Manufacturing of Kentucky

population of 41st "largest city" in Kentucky = _____
(number of TMMK employees)

95% of these are Kentuckians _____

II. Stamping

17-ton beginning of a car _____

operates like a cookie cutter _____

III. Body Weld

Who does 95% of the body welding on the cars? _____

a chisel checks for this _____

normal workday for a robot _____ hours the life expectancy of a robot _____ years

name for ordering device _____ Japanese word for hello _____

IV. Power Train

name of the engine for the Camry _____

name of the engine for the Avalon and the new Sienna mini-van _____

German word for meter which refers to work time on the line _____

V. Paint

3 words beginning with an r that refer to Toyota's environmental policy

R _____ R _____ R _____

Products from painting over spray that are used in landscaping _____

Cord that stops problems before they happen _____

Toyota team members make around 70 thousand of these yearly (not cars) K _____

You'll see this at fishing lakes or on the Toyota production line _____

VI. Plastics

plastic pellets become these _____

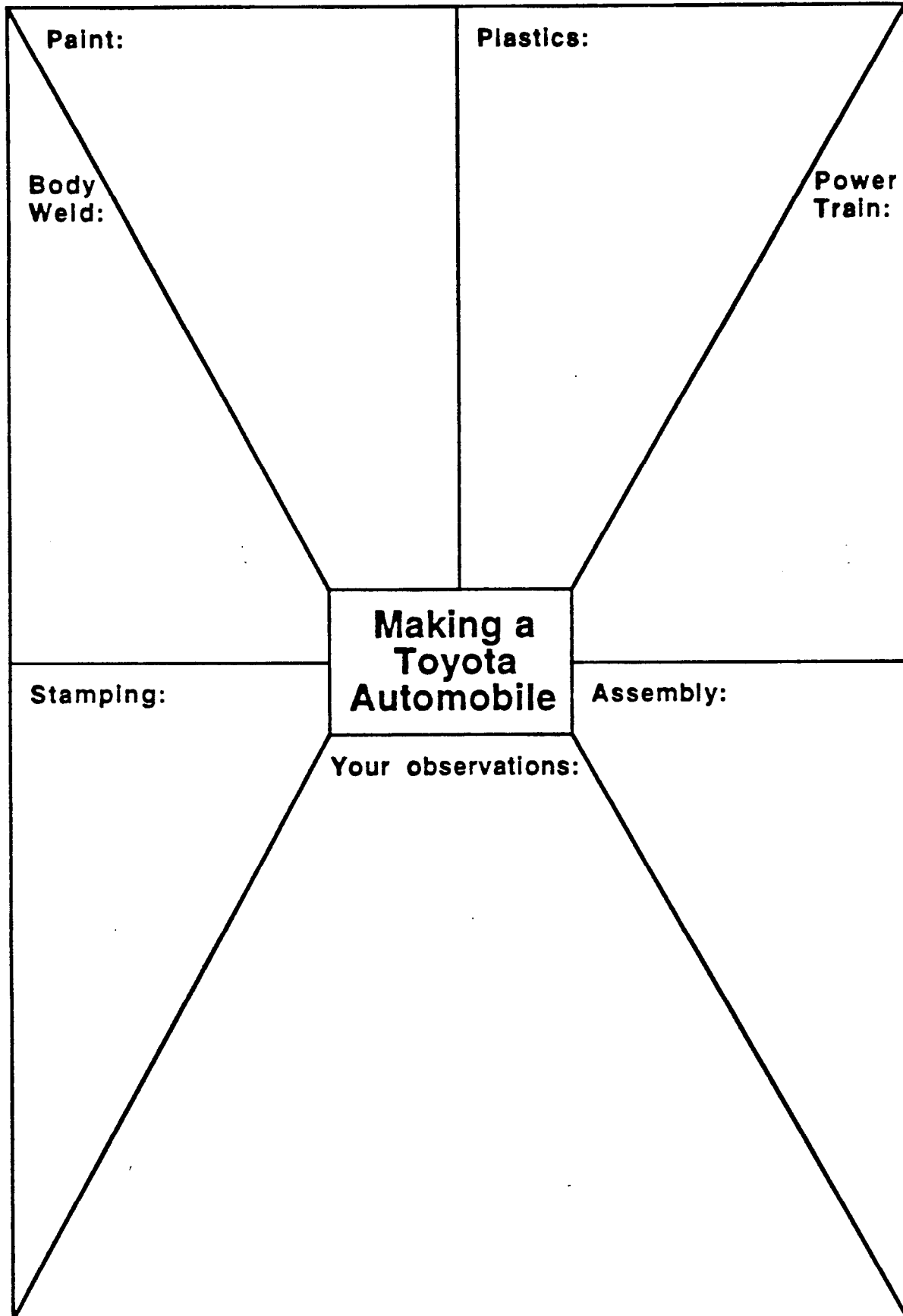
VII. Assembly

engine marriage is the joining of _____ and _____

VIII. Inspection

number one selling car in the United States in 1997 _____

Toyota Manufacturing Web



Possible Student Activities for Electronic Field Trip to Toyota

- Make peanut butter sandwiches as a class for a local day care or homeless shelter. Time the length of time to make a sandwich as one person and in the production line.
- Create a time line for the development of the car.
- Design a robot to do something that is dangerous or inefficient for you to do.
- Investigate automation at food processing plants such as the peanut butter factory, the bread factory or the local bottling company.
- Visit a local business and create a flow chart that describes their process in creating their product. Examples: A student explores the process of a local restaurant for creating hamburgers or a bakery for making pies. How have they designed the process for efficiency?
- Students role-play the interview process to find a new team member. Students list criteria before the interview and formulate questions to ask the person being interviewed. Students will create resumes showing themselves to be good team members. Each student will role-play both parts: interviewer and interviewee. Questions for follow-up: Which role did you like playing best? Why?
- Investigate how team work and collaboration were part of the creation of the Mars Sojourner and Pathfinder.
- Students brainstorm possible fuel sources for cars.
- Students examine road construction locally and determine how roads have influenced the development and growth of their town. What roads make Toyota's location in Georgetown possible?
- Students survey cars driven by faculty members and compare driver satisfaction. Students survey cars driven by students' families and survey satisfaction.
- Ask a local car dealer to discuss communication involved in selling a car and the information needed by potential car buyers. Students could gather information about a car and role-play providing the information to a customer. The local car dealer may return to hear the presentations and give advice.
- Determine and compare the area of a mini-van and the area of a family sedan. Each student finds the area for the family car and then find the average car area for the class.
- Have each student count traffic passing in front of their home for 10 minutes at 5:30. Estimate the high traffic areas. Create a map of high traffic areas of town.

- Study town accident reports and hypothesize cause. Develop a plan to decrease the number of car accidents in town.
- Talk with a local auto body repair shop about most frequently requested work and cost of repair.
- Ask a state or local police officer to discuss with students the effectiveness of seat belts and speed limits.
- Investigate the cause of accidents for new drivers.
- Talk with new drivers about lessons learned.
- Compare the cost and effectiveness of leasing a car, buying on a payment plan and paying with cash. Compare used cars to new cars.
- Design an assembly line for a class carwash and wax consider efficient use of people and water.
- Budget your individual family cost for owning and maintaining a car in your town. Include gas, insurance, and repairs. Determine how much it costs to bring you to school in a car and on the school bus.
- Select a car you'd like to own. Create a budget for using the car in your town. Determine monthly costs and minimal required salary to own the car.
- Students create a step by step picture diagram or photo sequence for a non-English speaker using directions from the car on how to change a flat tire.
- Determine the daily average number of miles driven by each student's family. Determine the average distance of the family car vacation trip. Discuss how the mode, median and range also represent the data.
- Learn how steel is made and used. Discuss metal alloys and materials used in cars. Compare steel with plastic for use as a reusable material.
- Create a learning center for a younger class about the process of building a car. If possible, use simple information about circuits to make it self-correcting for students. (A light would indicate a correct answer.)
- Ask a local seamstress or tailor to help direct a class sewing factory. Determine a product such as school vests or t-shirts to create and sell as a class. Design a flow chart for the creation of the product. Map out a production line. Set quality control measures and standards. Describe employee roles. Interview for job descriptions. Create a budget. Purchase the materials. Create the product. Sell the product.