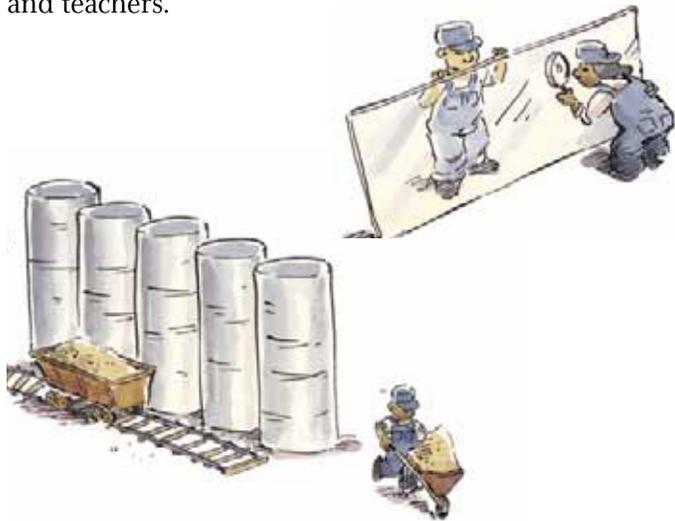


About *Transformed*

CDs start out as sand. Blackboard chalk comes from tiny sea creatures. Every single product in the world is made from elements found in nature. Discover how nature is transformed into more than sixty things we eat, drink, play with, wear or use every day.

Technology changes constantly, but the stages raw materials go through to become finished objects remain much the same. On every page of this book, these processes are described and illustrated step by step. The text and artwork combine playfulness with encyclopedic attention to detail.

This unique and fascinating book will inform and entertain every step of the way. Includes a glossary, index and further resources to help children, parents and teachers.



About the Author

Bill Slavin has illustrated numerous books for Kids Can Press, including *Drumheller Dinosaur Dance*, *Stanley's Party* and the Good Times Travel Agency series. Bill lives with his partner, fellow illustrator Esperança Melo, in Millbrook, Ontario.

Discussion Questions and Activities

The following discussion questions and activities are suitable for classes in language arts, social studies, science and technology.

Please note that some of the activities in this learning resource require students to visit their local library or use the Internet for research.

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1. Compare Old and New Methods of Production

Ask students to partner up and choose a product from the book that has been around since before the Industrial Revolution (mid-1700s). Provide students with the following examples to help get them started: wires, bricks, footballs, mirrors, dolls and marbles. Ask each pair to research how the product was made in the past and how it is currently produced. Have students compare and contrast the following in their reports: past and current production methods, the number of workers used in the past and the present and length of production time in the past and the present. As part of their responses, ask students to include their opinion, based on their research, on how technology has affected the production method of the product they chose. Have students provide drawings, photos or diagrams illustrating machines or production methods used in the past in comparison to the technology currently being used to produce that product. Ask each pair to present their research to the class.

2. Research an Inventor

Explain to students that an inventor or a team of inventors develops every product. Several inventors are mentioned throughout the book, for example: Eli Whitney, the inventor of the cotton gin; John Walker, the inventor of matches; Levi Strauss, the inventor of jeans; J.H. Kellogg and W.K. Kellogg, the inventors of cornflakes; and Thomas and Tom Adams, the inventors of chewing gum.



As part of an individual writing assignment, ask students to choose and research one inventor from the book. In their reports, students should research the following: What led to their discovery? What problem did their product solve? What was their method of discovery?

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When they have finished their reports, ask students to present their findings to the class and have students compare and contrast the methods of each inventor. After each presentation, pose the following question to your class: Do you think there are certain qualities or characteristics that most inventors share? Ask students to explain their answer using examples from their research and other presentations.

3. Invent Your Own Product

Begin this activity by posing the following question to your class: If you were an inventor, what would you invent and why? Divide students into groups of four and explain that they will be responsible for brainstorming, as a team, ideas for a new product that they want to invent (the product can be farfetched or realistic). Once each group has thought up a new invention, ask them to act like inventors and create a design for their product. Each group will be responsible for reproducing their design with labels on bristol board so that they can present it to the class. As part of their presentations, ask students to explain the reasons why they chose to create this product and the benefits of their invention.

4. Build a Conveyor Belt

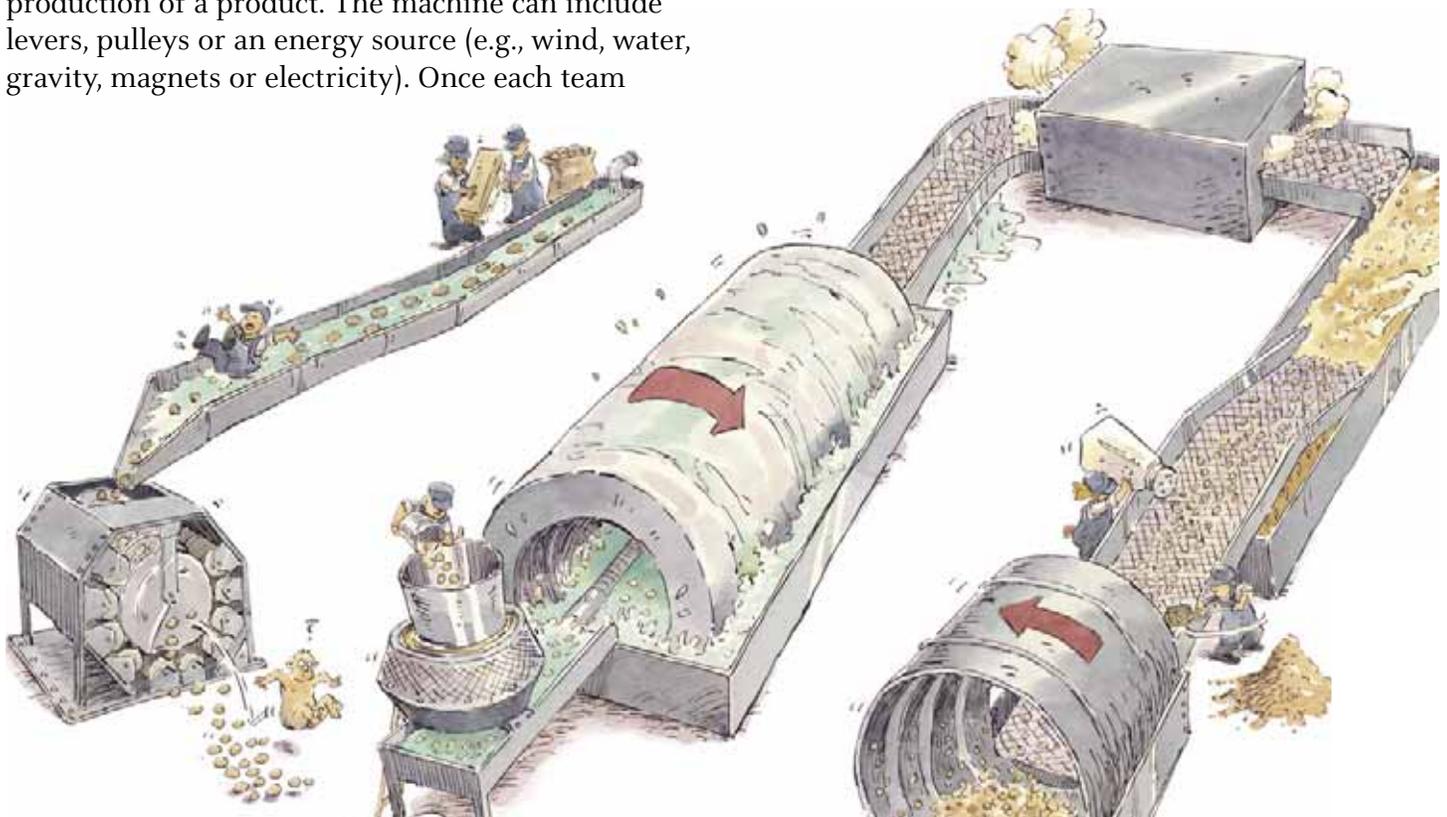
In groups of four or five ask students to design and build a miniature conveyor belt that will assist in the production of a product. The machine can include levers, pulleys or an energy source (e.g., wind, water, gravity, magnets or electricity). Once each team

has created a conveyor belt, ask them to write a description of it, including materials used, and draw a diagram labeling its parts. Students should also include a description of how they put their conveyor belt together.

As an extension to this activity, ask each group to add a product to their conveyor belt to see if the machine can perform an actual task. For example, students can place a jellybean on the conveyor belt and collect it in a container at the end. Have each group demonstrate their machine to the class.

5. Recycling Old Ideas

Explain to students that some products are invented by accident or by recycling an old idea. (For example, Ed Lowe put fuller's earth, used for soaking up spilled oil and gasoline, in bags and labeled it "kitty litter" — see page 46 of *Transformed* for more details.) Ask students to think of new uses for a familiar product that can be found around the classroom or their home. They can try recycling, repackaging or combining items in new ways. Have each group give their invention a name, write a product description for it and make a new package for it. Ask students to present their recycled product to the class.



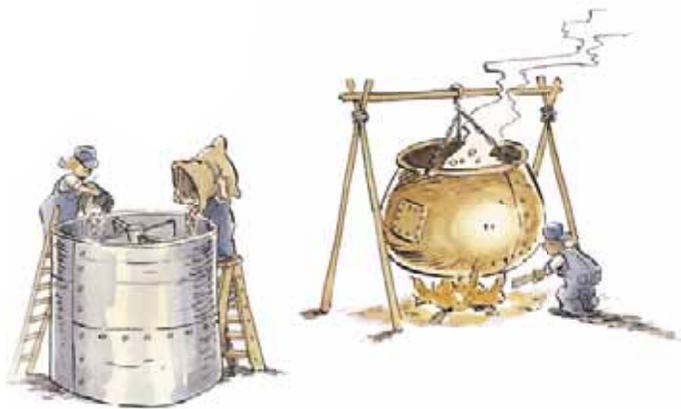
6. Write a Legend for a Product

Explain to students that the origins of many common products are unknown or have many explanations (have students read the introductions for “Silk,” found on page 128, or “Fortune Cookies,” found on page 90 of *Transformed*). Ask students to list reasons why the origins of some products remain unknown. (For example, the lack of historical documentation, breaks in archeological records, the difficulty of interpreting old records, the role of myth in ancient cultures and the tendency of inaccuracies to be repeated and passed on as fact.) Explain to students that even recently developed products have details that are in dispute (e.g., the invention of the ice cream cone has been claimed by at least two different sources.)

Ask students to choose a common item that is not in the book (e.g., nail polish, volleyballs, T-shirts, money, chocolate chip cookies, etc.) and make up a “legend” to explain its origins. Then ask them to research the real origin of the item and write a report comparing their legend with the real origin.

7. Research an Invention

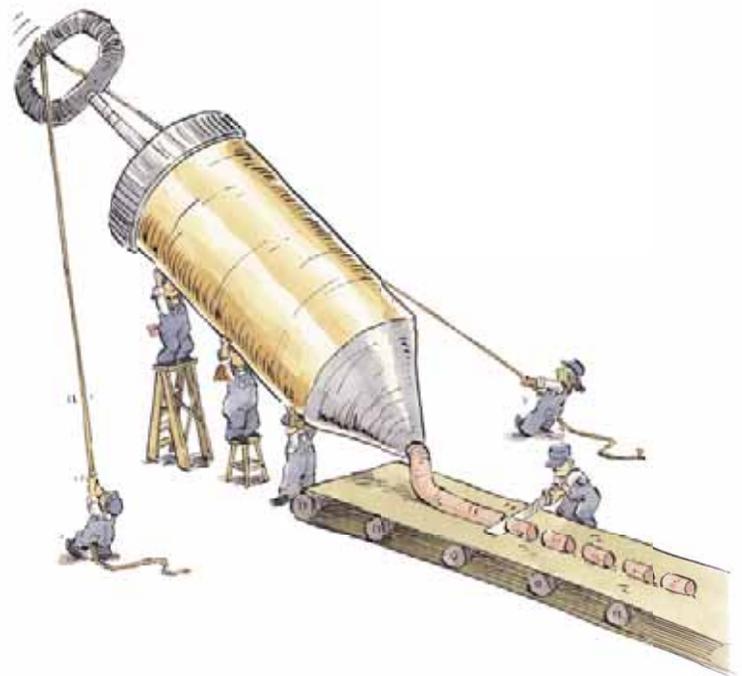
The invention of some machines or processes, such as the steam engine, the cotton gin and the assembly line, reduced the amount of time spent producing the product. Choose one invention or process and discuss it in class with your students. Ask each group to individually research another invention and investigate the following: When, by whom and where was it developed? What did it do and why was it an improvement over previous machines or methods? What happened as a result? Ask students to present their reports to the class.



8. Plastic Products

Ask students to refer to “Plastic Resins” found on page 152 of *Transformed* and discuss the five common manufacturing methods described for forming plastic products. Have students respond to the following questions, referring to the information in the book: What are the five ways to make plastic into products? Which is most common? Which methods are often used to form other materials into shapes as well? Why might you choose one method over the others to produce particular items (e.g., surfboard shells, a doll’s head, pasta, licorice sticks, etc.)?

Divide your class into five groups and assign each group one of the five methods listed in the book (injection, blow, compression, casting and extrusion). Ask each group to list as many products as they can think of that are produced by their assigned method. (Remind students that several are included in the book; however, students will be required to go to their local library or use the Internet to research other products.) Have groups write a report describing their assigned method. Students should also include its history and other interesting details about specific products made by that method. Ask each group to present their research to the class.



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