Graphing Recyclables

How Can We Recycle Resources to Reduce Waste?

Background

Each community faces different challenges with recycling and waste management. Geography, populations and local legislation will affect a community’s ability (or inability) to effectively manage its waste. Below is information regarding a rural area (Vermont) and an urban area (Chicago).

“While progress has been made in reducing and diverting solid waste since the passage of Vermont’s first robust solid waste management law (Act 78 in 1987), the amount of waste that Vermonter generate is significant at 5.18 pounds per person per day which leaves much room to improve upon waste reduction efforts. At the same time the diversion rate, amount of material kept out of landfills or incinerators, has stagnated in the mid 30% range for the last ten years…. This sustainable materials management strategy focuses on using materials throughout the entire lifecycle of a product or material with the intent of preventing overall waste, increasing reusability, and increasing recycling and organics diversion…. managing materials sustainably transforms the waste management industry into an industry that has even greater influence on local economic development, ability for communities to build a working landscape, and decrease Vermont’s greenhouse gas (GHG) emissions that contribute to climate change”


“The Illinois per capita waste generation rate was significantly higher than the national average in 2007...Illinois is relatively urban with 87.3% of its residents living in cities, urban areas ...and produce on average 25% more trash than rural areas.....Although the state imposes some mandates concerning recycling, the actual business of managing the solid waste stream falls on the shoulders of local and municipal government... Many municipalities do not provide waste removal directly but allow several companies to compete in garbage removal service market....Volatile commodity prices make it difficult for recycling companies to plan ahead and unexpected downturns in commodity prices may leave companies without the liquidity they need to finance day to day operations. Recycling companies may be unwilling or unable to take on the risk that volatile commodity prices pose.”

Common Core Alignments

GRADE 7

CC.SL.7.1
Speaking & Listening: Comprehension & Collaboration

CC.WHST.6-8.4
Writing in History/Social Studies, Science & Technical Subjects: Production & Distribution of Writing

CC.WHST.6-8.7
Writing in History/Social Studies, Science & Technical Subjects: Research to Build & Present Knowledge

CC.7.SP.7
Mathematics: Statistics & Probability

GRADE 8

CC.SL.8.1
Speaking & Listening: Comprehension & Collaboration

CC.WHST.6-8.6
Writing in History/Social Studies, Science & Technical Subjects: Production & Distribution of Writing

CC.WHST.6-8.7
Writing in History/Social Studies, Science & Technical Subjects: Research to Build & Present Knowledge

CC.8.SP.4
Mathematics: Statistics & Probability

Leading Question

Do recycling businesses pay us for the materials we collect?

Procedure

1. Students will investigate what materials are recycled in their area. They will write a letter and/or an email to their local waste management operation to ask for the information. They will compile a list of items recycled. They will create a second list of other items they feel should be recycled. Is the second list of materials technically possible to recycle, but are not recycled in the area? What is the difference in the lists? Why are some items recycled and others not?

2. Look at the list of recycling businesses serving your area. Call, write and/or email several recyclers. Ask them what price they are receiving for each ton of material they deliver to market. Ask them what factors influence the price they are paid for recyclables. Do they pay citizens for recyclables collected? Students will compile a report on their findings.

3. Graph the information by both (a) and (b):
   (a) Type of material
      - glass (green, brown, clear or mixed)
      - paper (newsprint, corrugated cardboard, white ledger or mixed)
      - metals (steel cans, bimetal cans, aluminum cans, other metals)
      - plastics (HDPE, PET, others)
   (b) Prices being offered by recyclers.

4. Study price changes on a monthly basis.

5. Using the graphed information, which recyclers pay the most? If the prices are the same, discuss why this is so. Why might the price vary from month to month?

6. Students will consider and include in their findings summary the following: If the payoff is not monetarily profitable, how else might it be profitable? How can increased recycling be promoted to citizens?

Evaluation

Each student will complete a written summary and evaluation of recycling and their findings. They will consider the following questions, as well as others they have considered in their findings. Do some recyclers pay more than others for material? Do prices change from month to month? What factors might influence prices paid for recyclables? (Some recyclers may include transportation, storage containers, etc., in the price offered.) They will discuss and share their reports in class.

Classroom Activities

A. Compare transportation costs with the value of the materials being recycled.

B. Discuss the questions on the following worksheet.
The Business of Recycling

1. Why is the recycling center located where it is?

2. If there is not a recycling center in your town, where would be the best place for one?

3. How might location affect the price recycling center operators pay and/or receive for their recyclables?

4. What kinds of equipment are used at the recycling center? Who pays for their costs?

5. What kinds of transportation might be used to deliver recyclables to a manufacturer?

6. How might the cost of transportation of any one recyclable affect the profit of the recycling center operator?

7. What might affect the price a manufacturer pays a recycling center for its recyclable material?

8. Should resources be recycled at a financial loss? If so, who should subsidize the recycling center operators so they will do it?

9. Can you think of any subsidies that government provides the wood and plastics industries that make it difficult for recyclable materials to compete?