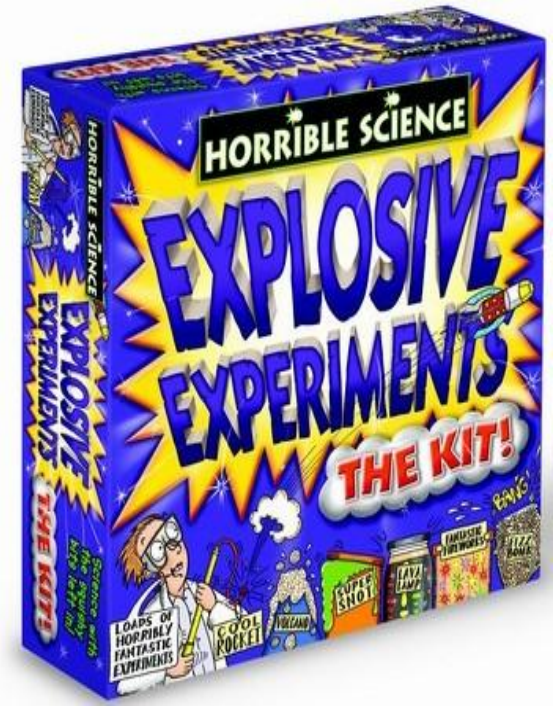
Classroom Experiments



Learning by doing

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Classroom Games/Experiments

- What are they?
- Often a simplified version of a research experiment
- Individuals make decisions that determine pay-offs
  - Individual choice
  - Interactive choice
- 20 – 40 minutes
- Many games are market simulations

Game 1: A market game

- Background
- One of the first classroom experiments (Chamberlin 1948)
- Referring to this game Holt(1996) stated that it:

> "would be my clear first choice if I were limited to a single lecture in a microeconomics course at any level"

Game 1: A market game

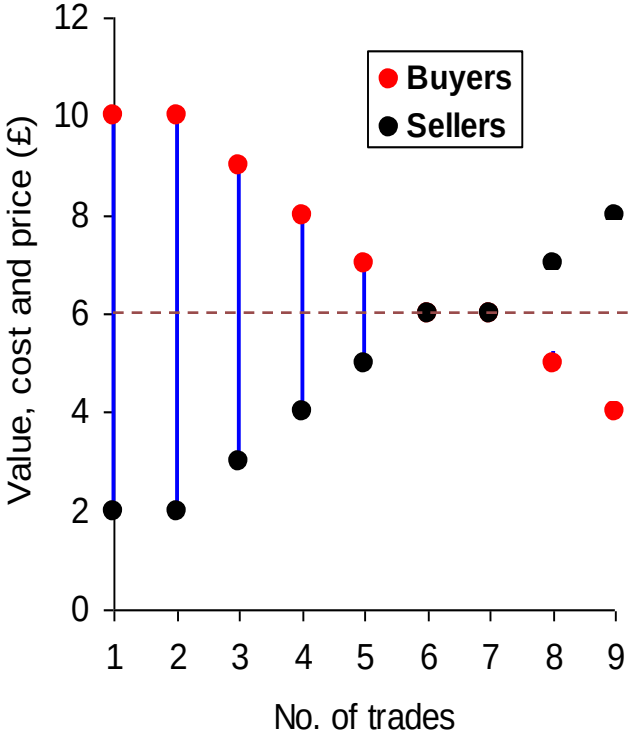
- Students divided into buyers and sellers
- Students given cards
  - Black for sellers of the item
    - Number on card gives cost of item in £s
    - Want to sell *above* value of card
  - Red for buyers of the item
    - Number on card gives value of item in £s
    - Want to buy *below* value of card
- Trading takes place
  - Individual buyers and sellers agree prices
    - trading pit/offer,counteroffer and haggling
  - Mark their gain on their sheet
  - No deal gives no gain or loss

Game 1: Reflections

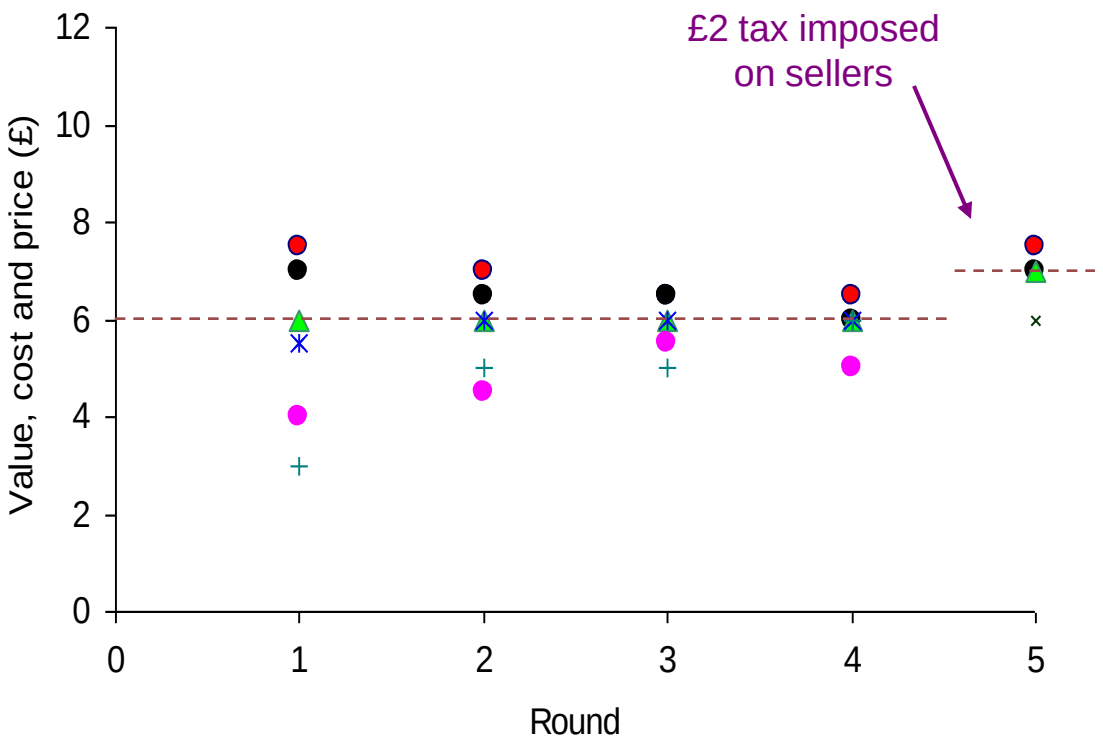
- Prices normally converge to competitive equilibrium
- Price convergence tends to be slower and variance of prices is greater than oral double auction
- However pedagogic advantages
- Sometimes negotiating ability of one side of the market is much better
  - Normally buyers

Game 1: Reflections

- Easy to demonstrate producer and consumer surplus
- Helps introduce the concept of efficiency
- Can discuss information issues
- Can introduce a tax of £x on suppliers or price ceilings/floors
- Monopoly version (one person has all black cards)



(b) Potential gains



(b) One we tried earlier

An 18 player game

Benefits of games

- Promote a more active learning environment and achieve deeper learning
- Experiential learning
- Applicability of abstract theory
- Fun/engaging
- Dealing with increasing heterogeneity
- Evidence that they have a positive impact on learning

Overcoming Potential Drawbacks

- Could have implications for the quantity of material "covered"
  - But deeper learning
- Will students take them seriously?
  - Linking them to other activities
- What if they don't work or contradict the predictions of theory
  - Useful for examining assumptions
- Will they suit all students? – different learning styles

Game 2: Expected value game

- TV show: Deal or No Deal?
  - Channel 4, six days per week (45 mins)
- US version playable online (link)
  - 26 people each with a suitcase of money, the amount not known to them
    - Sums of money vary from 1¢ to $1,000,000
  - One contestant us selected to play
    - … who eliminates suitcases in batches, whose contents are then revealed
    - After each batch, the contestant is offered a 'Deal' by the 'Banker', based on the values yet to be eliminated
    - The contestant chooses 'Deal' or 'No Deal'
- Paper-based version of UK game
  - See http://www.economicsnetwork.ac.uk/showcase/sloman_deal

Game 2: Reflections

- Virtually all students familiar with the game
- Easy to set up:
  - It can be played online
  - Or with envelopes and the sums of money on the whiteboard
- Illustrates decision-making under risk
  - Expected value; risk premia; probability; risk attitudes and what affects them

Game 3: Lemons Game

- **Activity**
  - Trading a product
  - Students split into groups: 6 sellers, 8 buyers,
  - Sellers (go first)
    - Choose price and quality (3 different qualities)
      - Given cost information on producing each quality
    - Can sell up to two units of that quality
    - Decisions posted on whiteboard/flipchart
  - Buyers
    - Decide in turn which offers to accept

Game 3: Common Questions

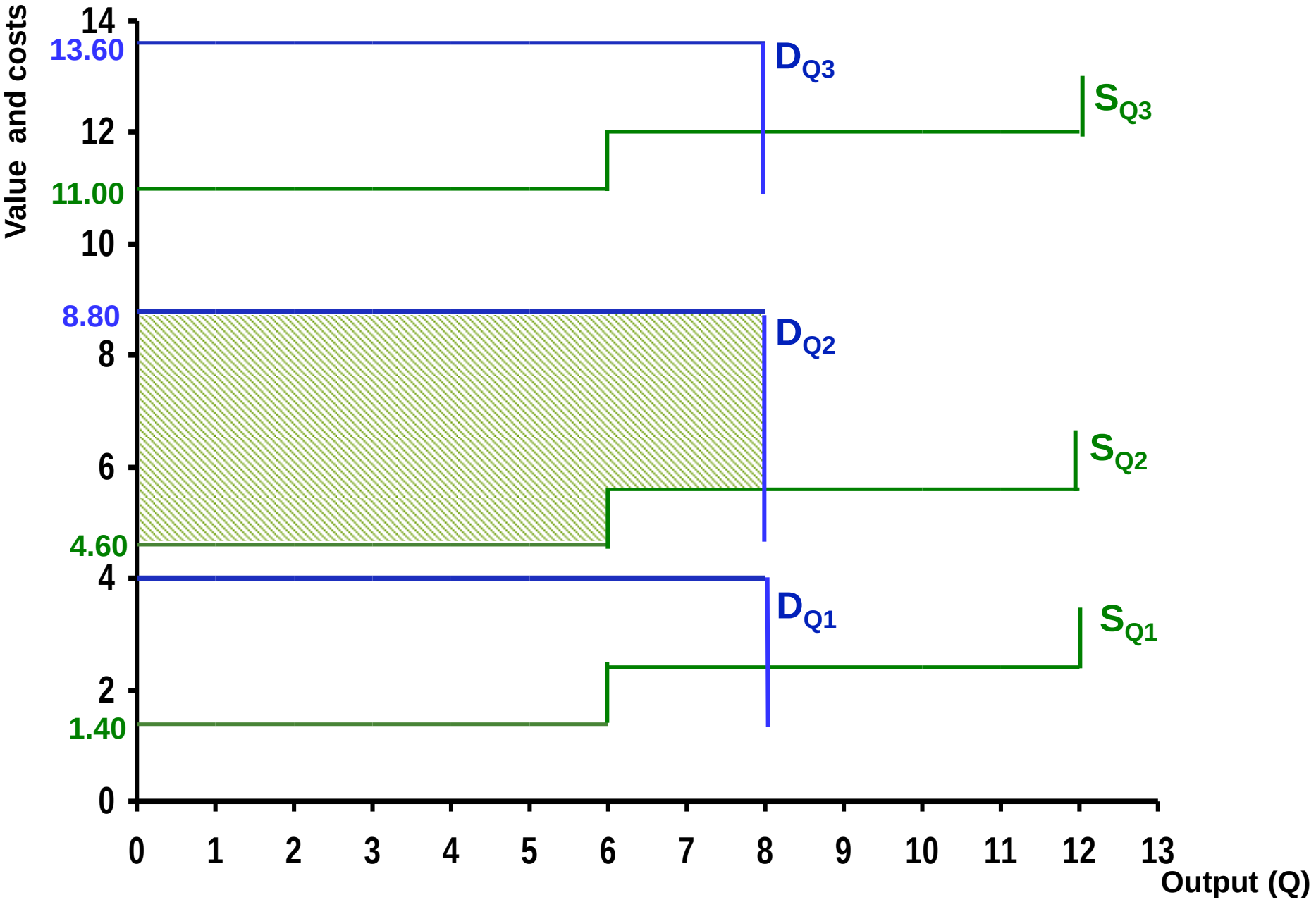
- Grade and price must remain the same for both units that the seller offers for sale in any given round
- Sellers cannot sell the first unit at one grade and price & the second unit at a different grade and price
- The seller does not incur costs on any output that remains unsold – Profit will be zero
- The seller can refuse an offer to buy
- The buyer can only purchase one unit/round and do not have to purchase from the sellers
- If the buyer does not purchase their surplus is zero

Game 3: Buyer Value and Seller Costs

	grade 1	grade 2	grade 3
Buyer value	£4.00	£8.80	£13.60

	grade 1	grade 2	grade 3
Seller cost of 1st unit	£1.40	£4.60	£11.00
Seller cost of 2nd unit	£2.40	£5.60	£12.00

Game 3: Demand and Supply by Grade



Game 3: Efficiency

- **Total surplus for grade 1**

  = (6 x 2.60) + (2 x 1.60) = **18.80**

- **Total surplus for grade 2**

  = (6 x 4.20) + (2 x 3.20) = **31.60**

- **Total surplus for grade 3**

  = (6 x 2.60) + (2 x 1.60) = **18.80**

Game 3: Reflections

- **Very easy to set up and fun to play**
  - Can easily be played in a seminar
  - Suitable for level 2 students
  - Can easily be adapted/extended
- **Can demonstrate**
  - Asymmetric information
  - Adverse selection
  - Lemons
  - Allocative efficiency
  - Competition / oligopoly

Game 4: Production function game

- **Activity**
  - Production runs (2) in a factory, involving moving balls from one place to another
  - Extra workers are added one at a time
- **Equipment:**
  - About 30 balls (e.g. tennis balls)
  - 4 buckets (or baskets or cardboard boxes)
- **Students divided into two teams**
  - Object to get as many balls from one end to the other in 30 seconds

Game 4: Reflections

- **Easy to set up and fun to play**
  - Can bring alive a potentially dry subject area
  - Flexible: can be played with 1, 2 or more teams
- **Can demonstrate**
  - Diminishing returns
  - *TP*, *AP* and *MP*
  - Can derive *TC*, *AC*, *MC*, *TR*, *AR*, *MR* and Profit
  - Shifts and movements along product and cost curves from technological change
  - Effects of changing fixed and variable costs

Game 5: Public goods game

- **Aim**
  - Aim is to make as much money as possible, irrespective of what others make
- **Activity**
  - Each person (or pair) is given four cards of the same value (e.g. four threes or four queens)
  - Each person plays two cards each round
- **Scoring**
  - Black cards have no value
  - Red cards are worth £1 for *everyone* if played and £4 just to the individual if not played.

Game 5: Reflections

- **Very easy to set up and fun to play**
  - **Can easily be played in a tutorial**
  - **Flexible: can be played with up to 13 individuals or pairs**
- **Can demonstrate**
  - **Public goods and external benefits**
  - **Prisoners' dilemma and Nash equilibrium**
  - **Collusion versus competition**
  - **Motivation and altruism**

Game 6: A 'Keynesian Beauty Contest'

- A game about investor expectations
  - predicting share prices based on what you think other people will do
- Simple to play
  - No equipment required other than:
    - a calculator for the tutor
    - a whiteboard/flipchart for recording results
- The game (each round)
  - Students have to select a number from 0 to 100
  - A prize is given in each round to the student who selects a number closest to 2/3 of the mean

Game 6: A 'Keynesian Beauty Contest'

- Each person of ***N-players*** is asked to choose a number from the ***interval 0 to 100***.
- The winner is the person whose choice is closest to ***p*** times the ***mean*** of the choices of all players (where p is, for example, ***2/3***). The winner gets a ***fixed*** prize (e.g.a chocolate).
- The same game should then be repeated for ***several periods.*** Students ***are informed*** of the ***mean, 2/3 mean*** and ***all choices*** after each period.
- Students should write down each time (or at the end) a brief comment about how they came to their choice.
- Time to think in each period: about ***3 minutes***

Game 6: Reflections

- Link1 Link 2
- At the end
  - Students can be asked to explain their decisions
- Can demonstrate:
  - Expectations formation
  - Iterative thinking / progression
  - Movement to Nash equilibrium

Computerised Experiments

- **Advantages**
  - "Free ride" on existing resources
  - Little preparation
  - Speedy
  - Automatic tabulation of results
  - Some are difficult to do hand-run
- **Limitations**
  - Class size
  - Computing facilities
  - Time constraints

More Information

- See Economics Network site for a range of games and tips on their use
  - http://www.economicsnetwork.ac.uk/themes/games.htm
  - http://en.wikiversity.org/wiki/Economic_Classroom_Experiments