

# 發現

## 看不見

### 的



## Seeing the Invisible Hand

### Game Rules: (規則說明)

- There are 3 rounds (共進行四個回合)
- Each group start with (每組的基本籌碼為) **150 Ecoins**
- You are awarded based on total Ecoins added at the end (遊戲結束後·以手上增加的籌碼總量計分)
- In each round, each group will draw a card; please make sure other groups do not see it.  
(每組在每回合都會抽取一張撲克牌·請確保別組無法看到這張牌)



**Note that Luck is involved here!**  
(請注意：本活動有一定的機運成分存在)

## Game Rules: (規則說明)

➤ Num on the card is transferred to Ecoins

(撲克牌牌面【點數】及其所代表【金額】的對照表)

➤ 點數(card #)\*10 = 金額 (Ecoins)

牌面點數	A	2	3	4	5	6	7	8	9	10	J	Q	K	card
金額	10	20	30	40	50	60	70	80	90	100	110	120	130	Ecoins

## Now we shall introduce...

(接下來要特別介紹...)

Your card is black

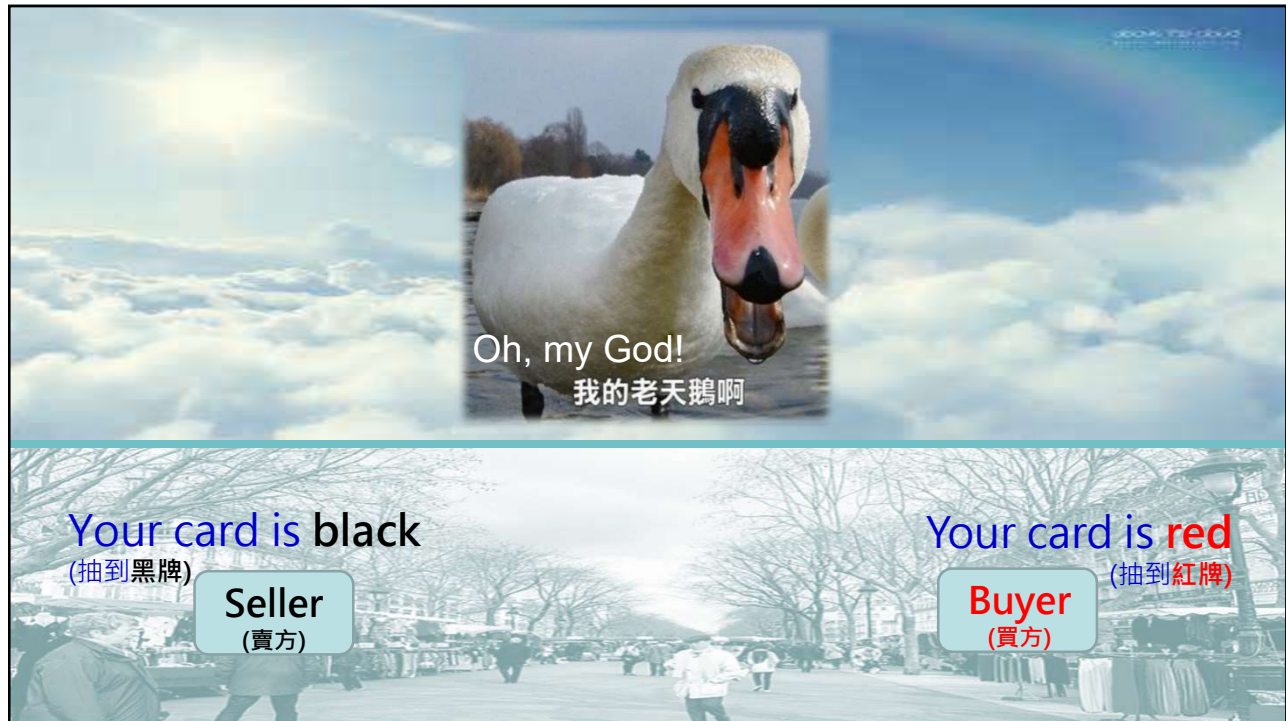
(抽到黑牌)

**Seller**  
(賣方)

Your card is red

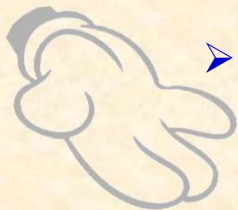
(抽到紅牌)

**Buyer**  
(買方)



## Game Rules: (規則說明)

- Seller if card is black (抽到黑牌是賣方)
- Pays \$\$ amount on black card to buy 1 [Product Card] from:  
(要購入 1 張【商品卡】 · 可以持手上黑牌以牌面金額找)
- E.g. (例如) ♣ 5 = 50 Ecoins
- Sells [Product Card] to buyer  
(可以將【商品卡】賣給買方)



➤ **Seller Profit (賣方利潤) =**  
**Price (成交價格) - Cost (進貨成本)**

➤ **Higher Price (成交價格愈高)**  
 → **Higher Profit (賣方利潤愈多)**

➤ **Price (成交價格) < Cost (進貨成本)**  
 → **Sell at a loss (賣方虧本)**

➤ **No Trade (如果沒有交易)**  
 → **0 Profit (利潤為零)**



Oh, my God!  
我的老天鵝啊

Product (商品卡)

50 Ecoins

Seller (賣方) ♣ 5

Product (商品卡)

Buyer (買方)

Ecoins Price (成交價格)

## Game Rules: (規則說明)

➤ **Buyer if card is Red (抽到紅牌是買方)**

➤ **Buy (at most 1) [Product Card] from seller**  
 (可以向賣方買【商品卡】(每人限購 1 張))

➤ **Earns \$\$ amount on red card if sells [Product Card] to:**  
 (可以持手上紅牌以牌面金額將【商品卡】賣給:

➤ **E.g. (例如) ♦ J = 110 Ecoins**





Oh, my God!  
我的老天鵝啊



## Game Rules: (規則說明)

➤ E.g. If Jack the ♦J traded with Fred the ♣5 at price \$78 (舉例來說 · 如果持有 ♦J的小明與持有 ♣5的小華以78元成交)

➤ Gains of Jack are (小明得到的好處為)

$$110 - 78 = 32$$

➤ Profits of Fred are (小華的利潤則是)

$$78 - 50 = 28$$

## Game Rules: (規則說明)

➤ When a buyer and a seller group reach agreement, **bring your cards to OMG** to complete the trade

(買賣一旦成交，請雙方一起帶著撲克牌找老天鵝完成交易)

1. Seller buys **[Product Card]** from **OMG** at **card \$\$**

(賣方向老天鵝購買【商品卡】，支付賣方卡片金額)

2. Buyer buys **[Product Card]** from seller and write the **price it**. (買方向賣方購買【商品卡】並在其上寫下「成交價格」)

3. **OMG** buys **[Product Card]** from buyer at **card \$\$**

(老天鵝向買方購回【商品卡】，支付買方卡片金額)

## Game Rules: (規則說明)

1. Trade is **voluntary**, (買賣均須在自願的前提下進行，不能強迫)

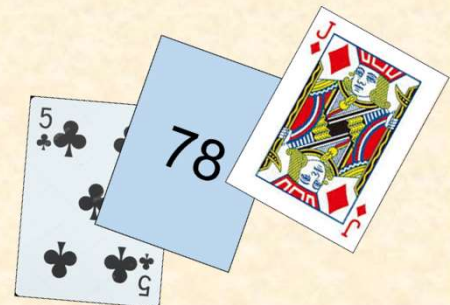
2. Trade is **irrevocable** if reported, (申報交易後不能反悔。)

3. **Cannot show your card to others**. (不可亮牌給別人看。)

## Quiz: (小測驗)

➤ What if Jack has **♥5** and Fred has **♠K**? (若小明抽到♥5，小華抽到♠K?)

➤ What if King has **♣9** and John has **♠2**? (若老王抽到♣9，小強抽到♠2?)





Each group send one to draw a card

(請每組派一位來找主持人抽一張撲克牌)

Sellers buy [Product Card] from OMG

(賣方請跟老天鵝進貨)

Fill out the top of Q1 (填寫學習單第 1 題的上半部)

Seeing the invisible hand (發現看不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)	J			
Dollar (牌面金額)	110			

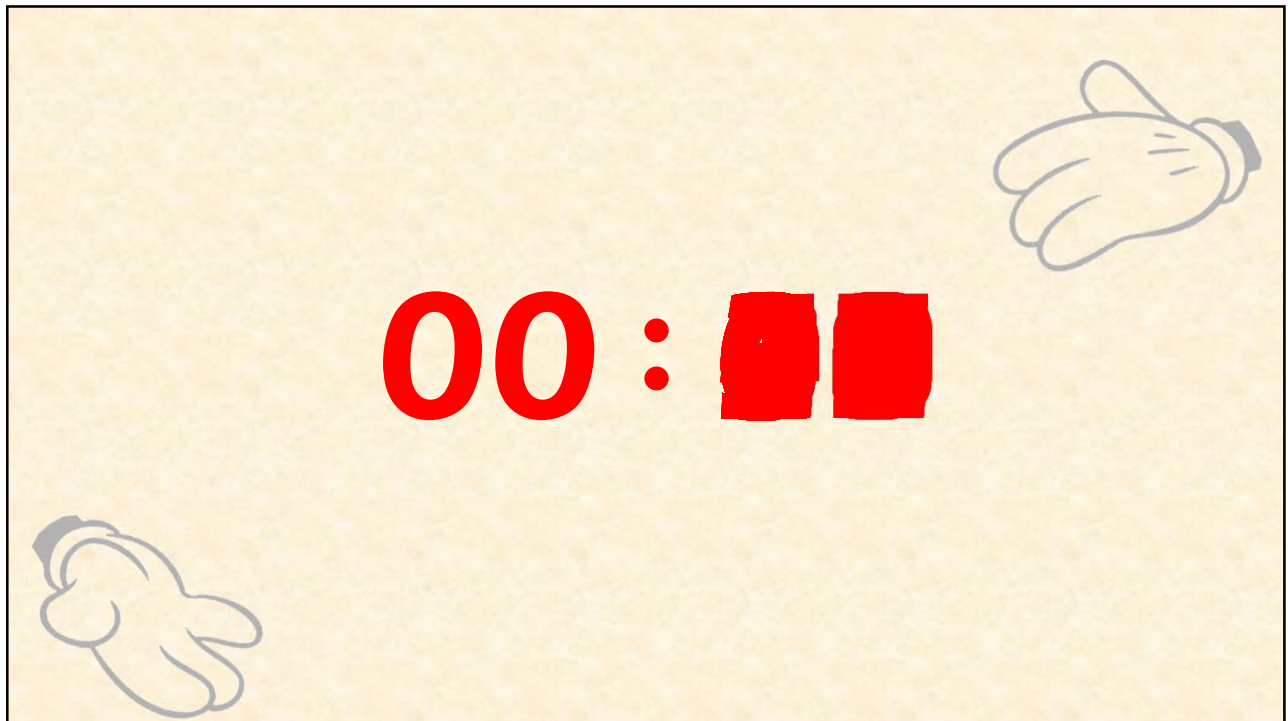
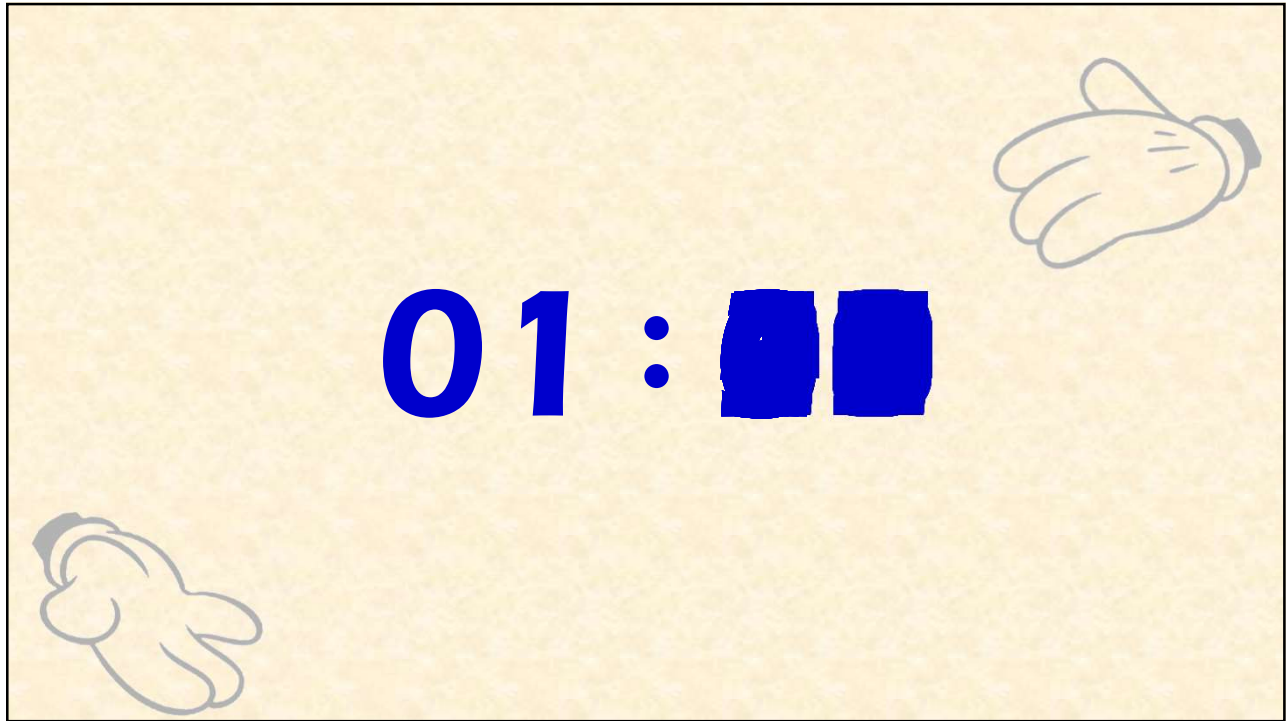
To complete the trade, pairs who reach agreements can bring their cards & \$\$ to **OMG**  
(成交雙方請帶著撲克牌和籌碼找...)

(老天鵝)

➤ Round 1: Free-form bargaining (3min) 第一回合: 自由交易

02 : ■■





## Return your card if no trade; sellers get refund from OMG (請沒有成交的各組交回撲克牌、賣方請跟老天鵝退貨)

Fill out the bottom of Q1 (填寫學習單第 1 題的下半部)  
Seeing the invisible hand (發坑有不見的手)

1. Was the card you received red or black? What was the card number and dollar amount? Did you make a trade? Earn or lose money? What was your net profit? 你抽到紅牌還是黑牌? 牌面數字或金額是多少? 買賣有成交嗎? 賺了還是虧了? 淨得多少好處或利潤呢?

Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)	J			
Dollar (牌面金額)	110			
Price (成交價格)	78			
Earn/Lose (盈虧)	E(賺)、L(賠)	E(賺)、L(賠)		
Profit (好處/利潤)	32			

**Cross if no trade (沒有成交就打X)**

## Each group send one to draw a card

(請每組派一位來找主持人抽一張撲克牌)

## Sellers buy [Product Card] from OMG

(賣方各組請跟老天鵝進貨)

Fill out the top of Q1 (填寫學習單第 1 題的上半部)  
Seeing the invisible hand (發坑有不見的手)

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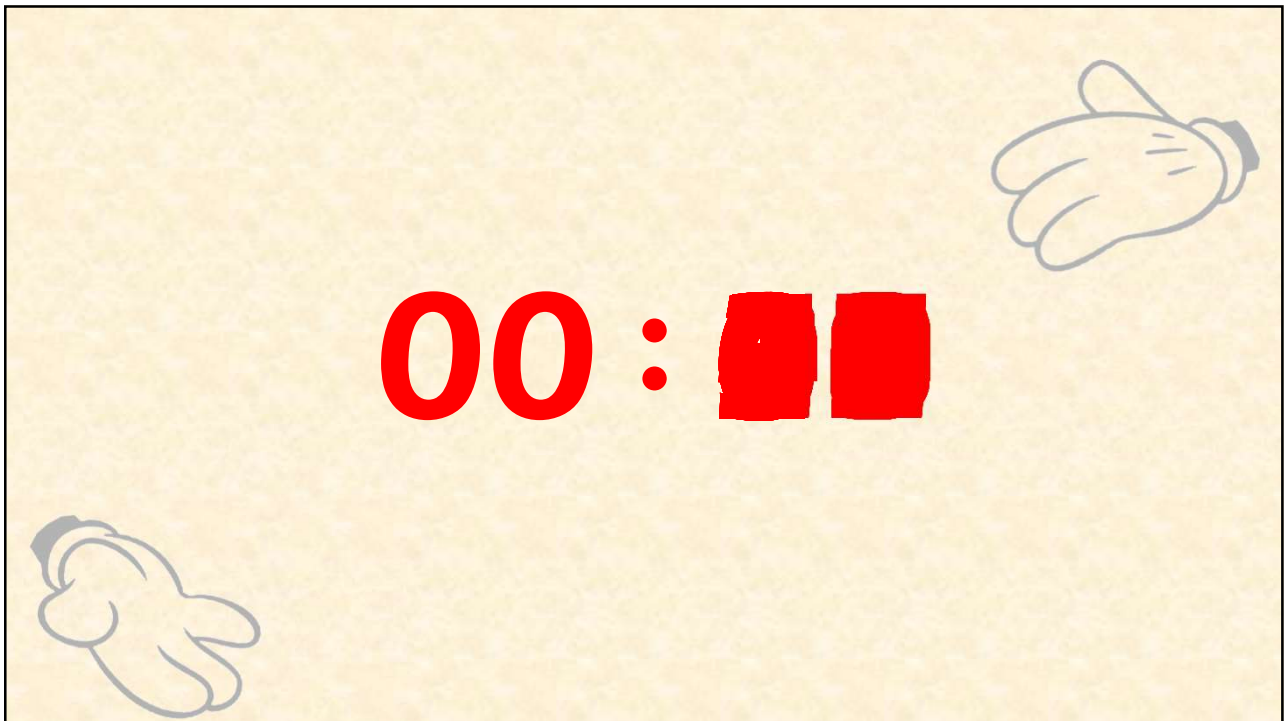
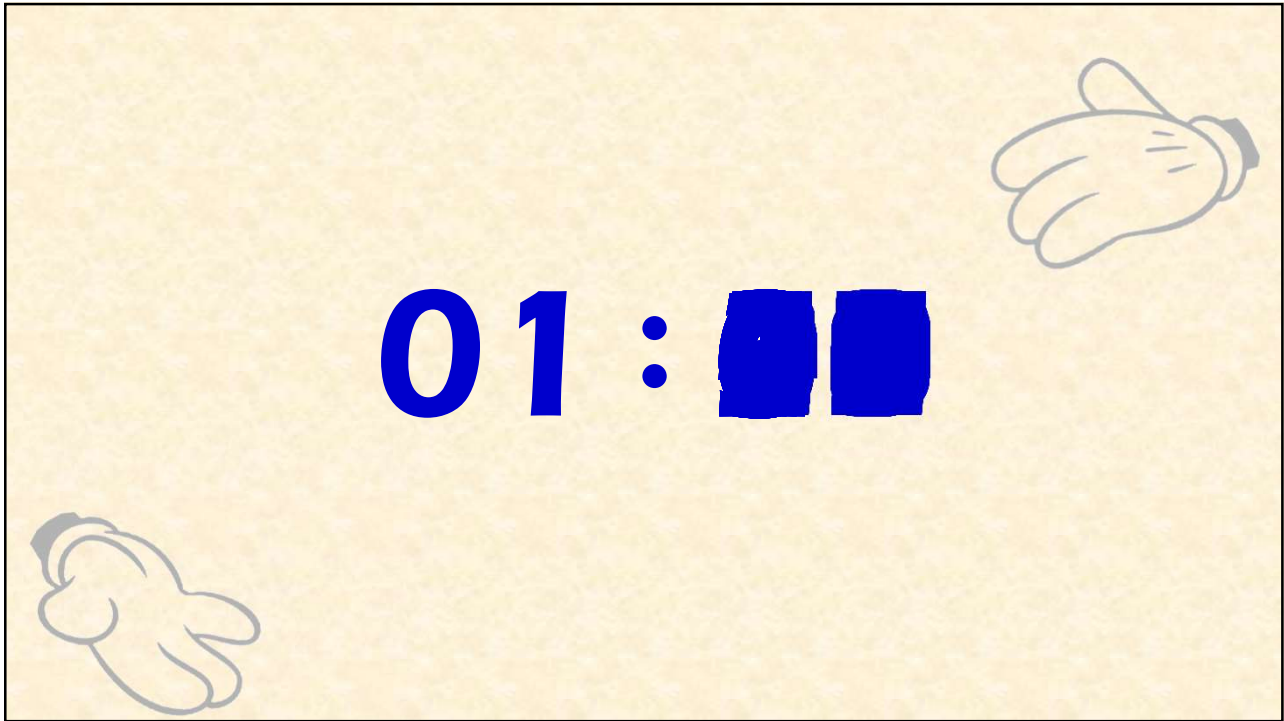
Round (回合)	1	2	3	4
Color (牌面顏色)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)	R(紅)、B(黑)
Num. (牌面數字)				
Dollar (牌面金額)				

To complete the trade, pairs who reach agreements should **bring cards & \$\$ to** **OMG**  
 (成交雙方請帶著撲克牌和籌碼找...)

**OMG**  
(老天鵝)

- ~~Round 1: Free-form bargaining (3min) 第一回合: 自由交易~~
- Round 2: Free-form bargaining (3min) 第二回合: 自由交易

02 : ■■



## Return your card if no trade; sellers get refund from OMG (請沒有成交的各組交回撲克牌、賣方請跟老天鵝退貨)

**Fill out the bottom of Q1 (填寫學習單第 1 題的下半部)**  
**Seeing the invisible hand (發現有不見的手)**

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Num. (牌面數字)				
Dollar (牌面金額)				
Price (成交價格)				
Earn/Lose (盈虧)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)
Profit (好處/利潤)				

## Each group send one to draw a card

(請每組派一位來找主持人抽一張撲克牌)

## Sellers buy [Product Card] from OMG

(賣方各組請跟老天鵝進貨)

**Fill out the top of Q1 (填寫學習單第 1 題的上半部)**  
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Dollar (牌面金額)				

To complete the trade, pairs who reach agreements should **bring cards & \$\$** to **OMG**  
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**OMG**  
 (老天鵝)

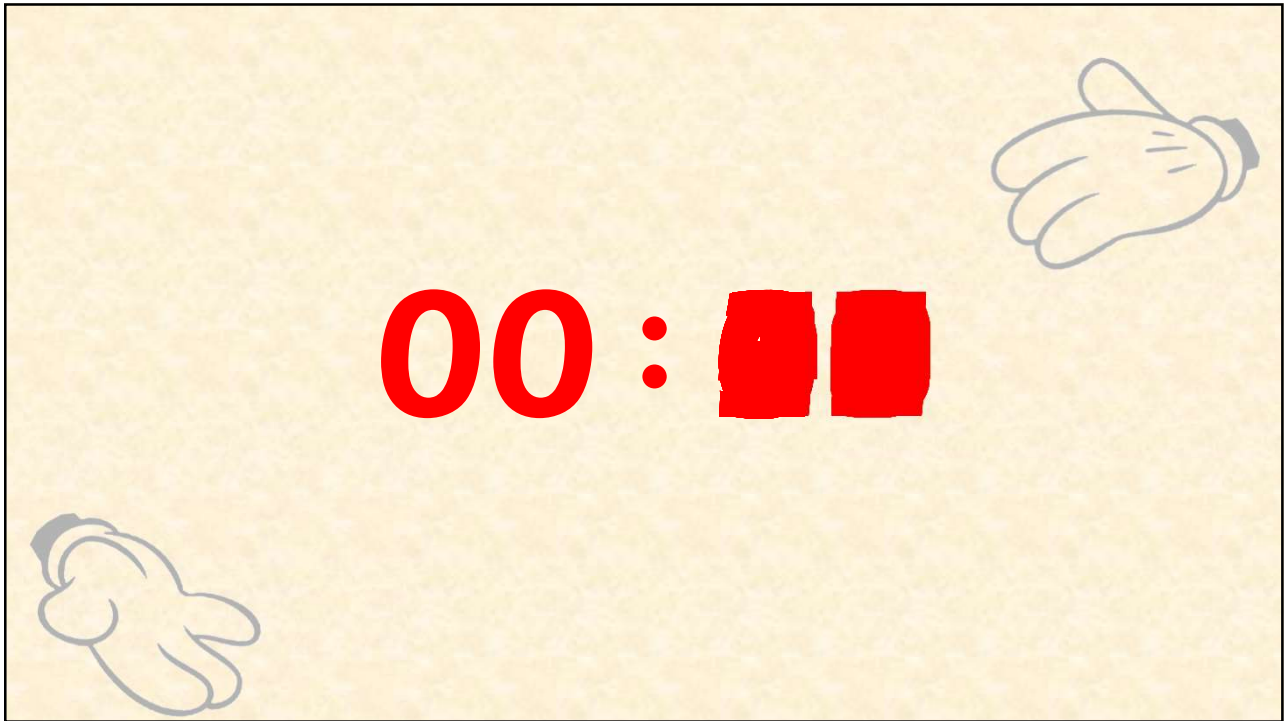
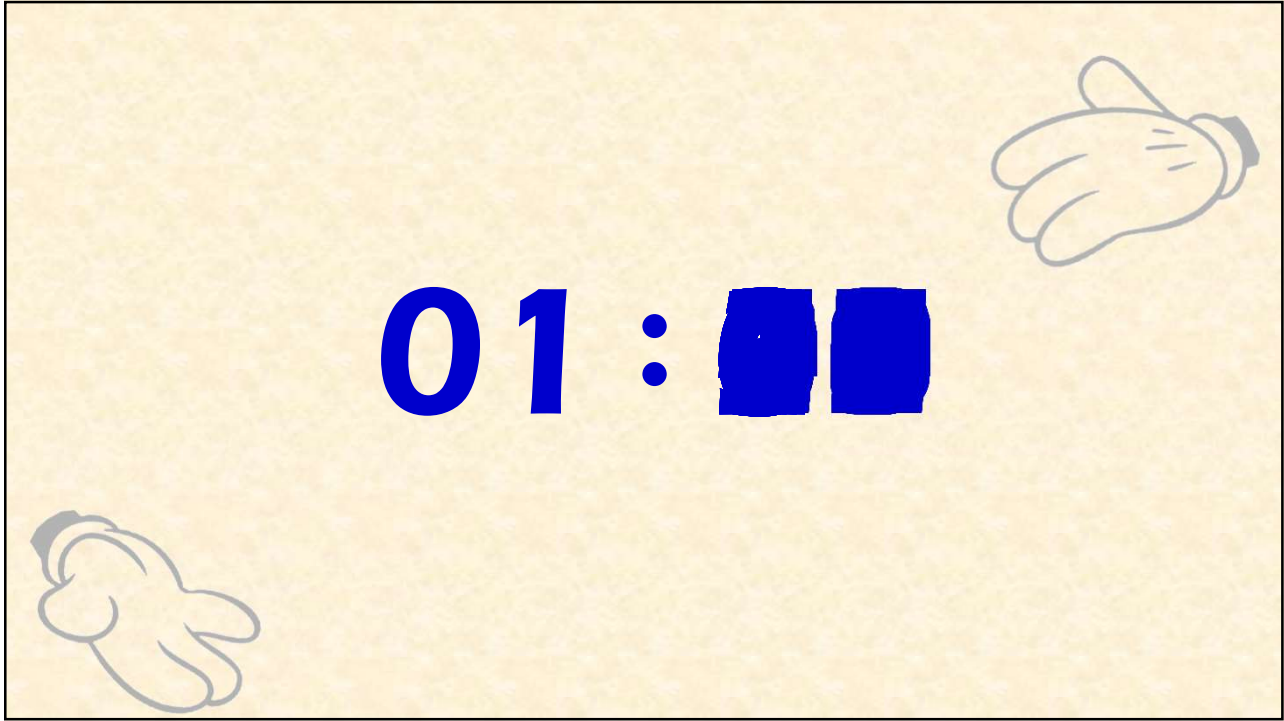
- ~~Round 1: Free-form bargaining (3min)~~ 第一回合: 自由交易
- ~~Round 2: Free-form bargaining (3min)~~ 第二回合: 自由交易
- Round 3: Open Double Auction (3min) 第三回合: 喊價競標

**107 SELL !!**

**23 BUY ~**

**TAKE!**

**02 : ■■**



Return your card if no trade; sellers get refund from OMG (請沒有成交的各組交回撲克牌、賣方請跟老天鵝退貨)

Fill out the bottom of Q1 (填寫學習單第 1 題的下半部)  
seeing the invisible hand (發現看不見的手)

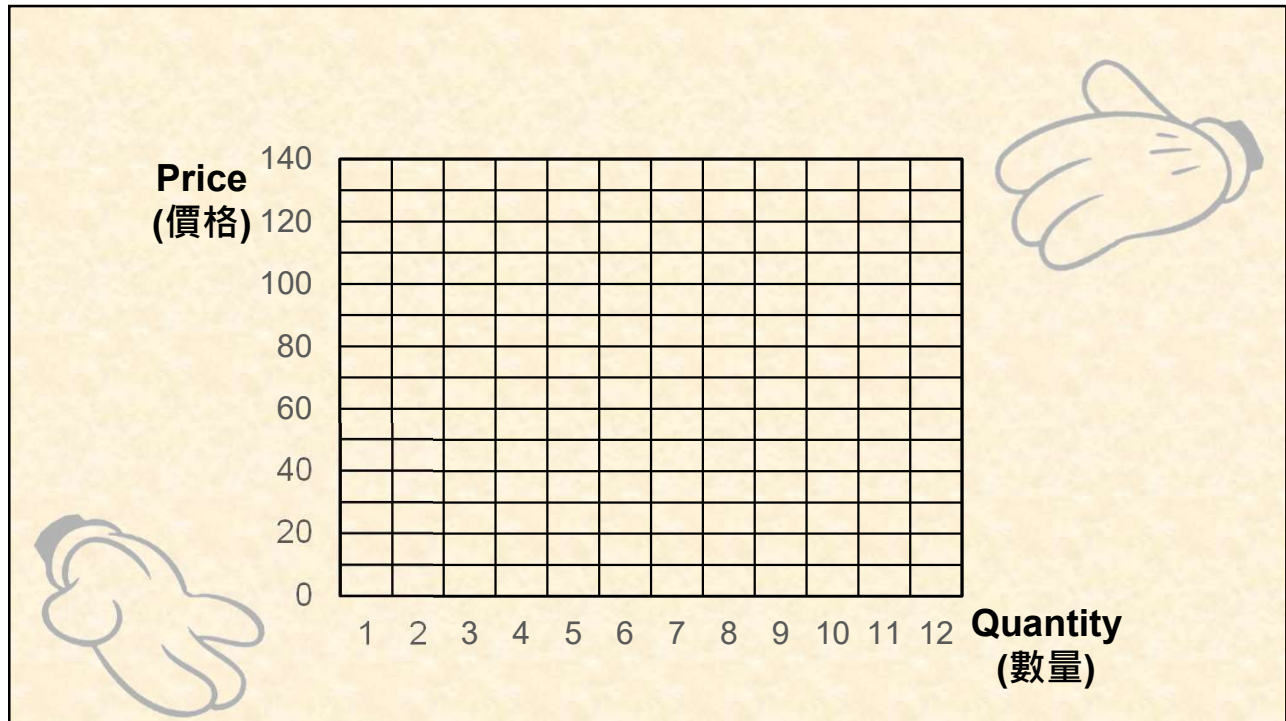
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Num. (牌面數字)				
Dollar (牌面金額)				
Price (成交價格)				
Earn/Lose (盈虧)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)	E(賺)、L(賠)
Profit (好處/利潤)				

- What is the supply-demand model? (Q2)
- How is this classroom experiment related to it?  
(學2: 你聽說過「供需模型」嗎? 這個遊戲跟供需模型有什麼關係?)
- Review your record in Q1 (請檢視你在學 1 中關於第一回合的記錄)

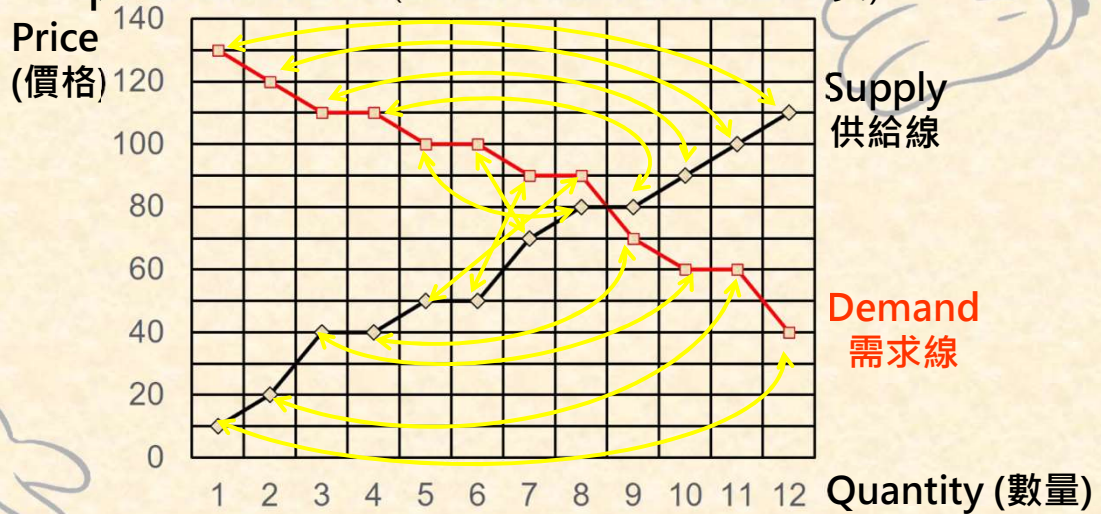
Round (回合)	1	2	3	4
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Num. (牌面數字)				
Dollar (牌面金額)				



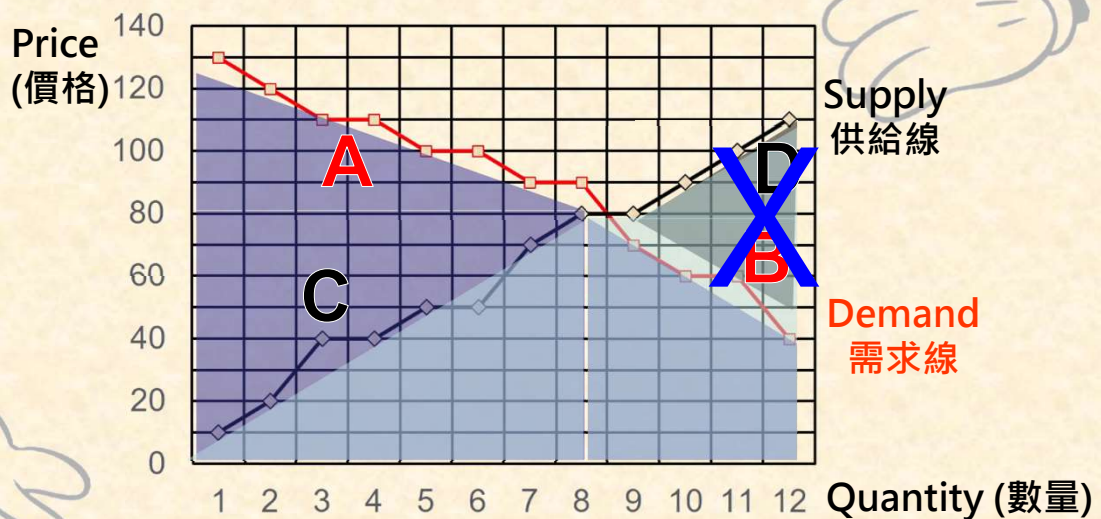


- **How is your reservation price related to the card you received? (Q3)**  
(學3: 在找尋交易機會時, 你能夠接受的「價格底限」跟抽到的牌有什麼關係呢?)
- **When the price is \$X, how many buyers and sellers want to trade? (Q3)**  
(學3: 當價格被設定在X元時, 買賣雙方各有多少人願意交易呢?)

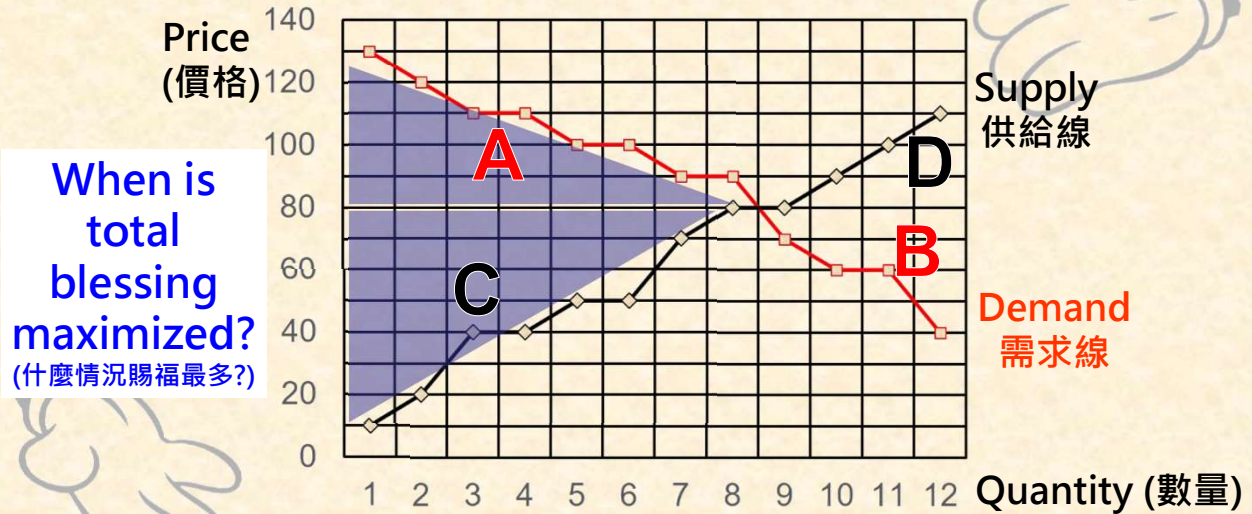
➤ What is the maximum number of trade possible here? (學4: 範例中可能成交的最大數量是多少?)



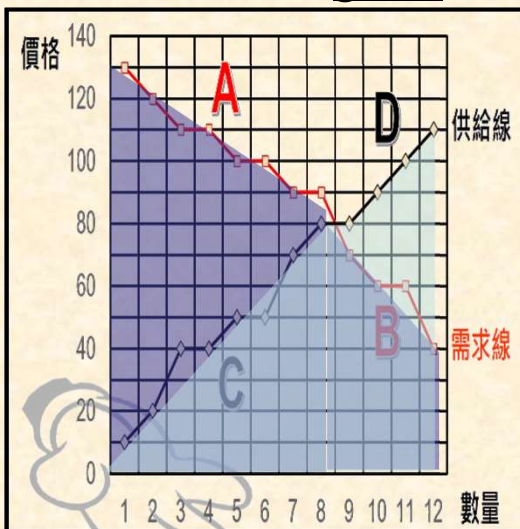
➤ Is it always good to have more transactions? How do we define good? (Q5) (學5: 成交量愈多愈好嗎? 怎麼訂出「好」的標準?)



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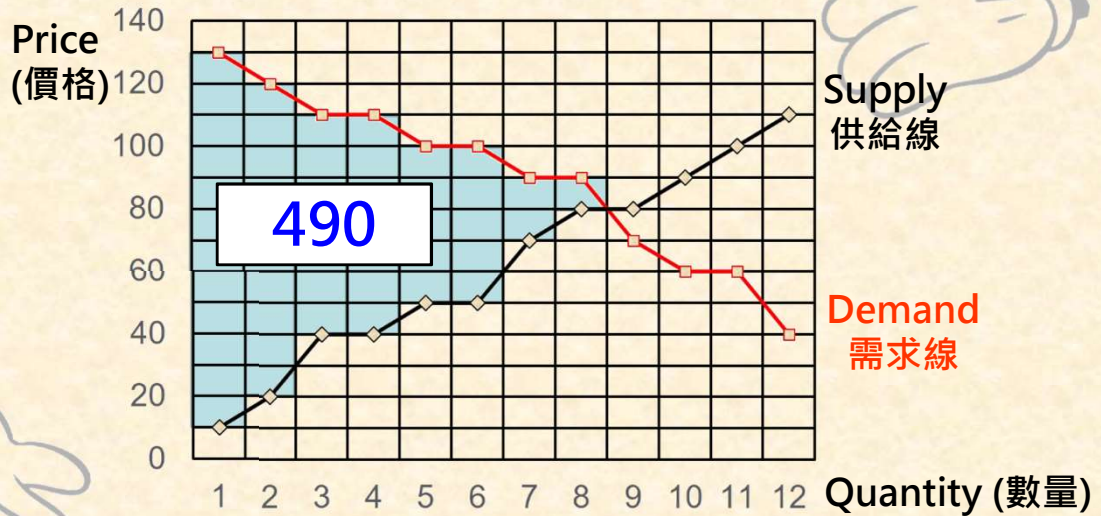
**Equality** (不患寡而患不均)

- ✓ Aver. blessing =  $(A + B - C - D) \times \frac{1}{24}$
- ✓ (平均每人賜福) (需調查每個人抽到什麼牌·然後配對)
- ✓ Require knowing everyone's card
- ✓ **Will you tell the truth?** (會否誠實申報?)

**Efficiency** (老天鵝最大賜福)

- ✓ Aver. blessing =  $(A - C) \times \frac{1}{16} \times \frac{16}{24}$
- ✓ (平均每人賜福)
- ✓ **Happens naturally** (根據自利原則自然發生)

- Calculate the (**ideal**) total amount of blessing (Q6) (學6: 最大的總賜福量 (**理想值**) 是多少?)



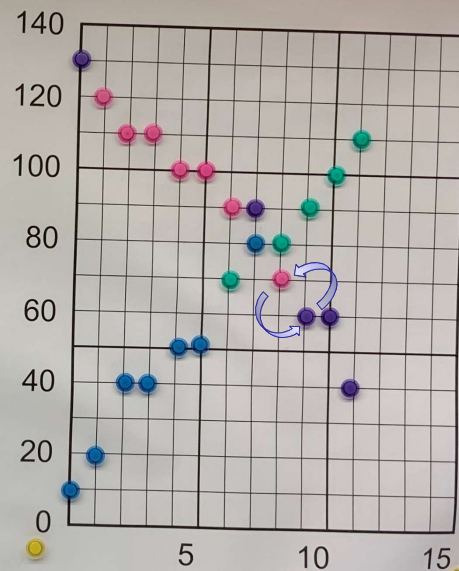
- Calculate Round 1's **actual** total amount of blessing

(學6: 請計算第一回合老天鵝**實際的**總賜福量)

- $A = 120 + 110 + 110 + 100 + 100 + 90 + 60 = 690$
- $B = 10 + 20 + 40 + 40 + 50 + 50 + 80 = 290$
- $A - B = 400$ , so  $400 / 490 = 81.6\%$

- What is your card in Round 3? Did you trade?
- (學1: 第三回合時你抽到什麼牌? 有沒有成交?)

### 自由交易



➤ Calculate Round 3's **actual** total amount of blessing

(學6: 請計算第三回合老天鵝**實際的**總賜福量)

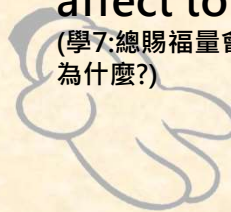
➤  $A = 130 + 120 + 110 + 100 + 100 + 90 + 90 = 740$

➤  $B = 10 + 20 + 40 + 40 + 50 + 50 + 70 = 280$

➤  $A - B = 460$ , so  $460 / 490 = 93.9\%$

➤ Does (each) transaction price affect total amount of blessing?

(學7: 總賜福量會不會受到(各筆交易的)成交價格所影響? 為什麼?)

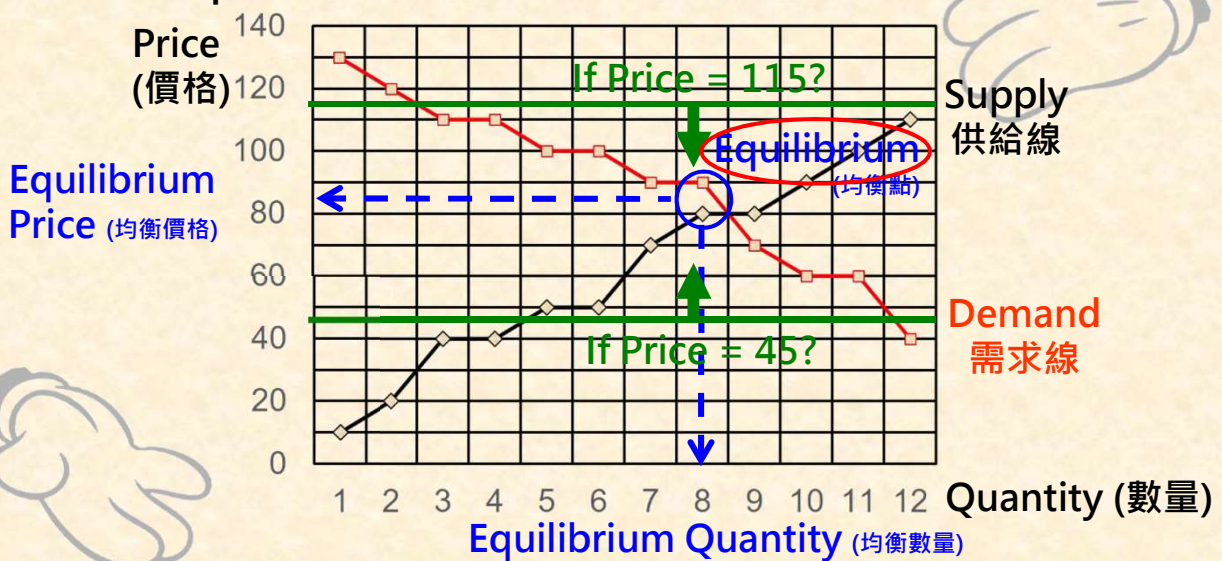


**Which are affected?**

(哪些結果會受到影響?)



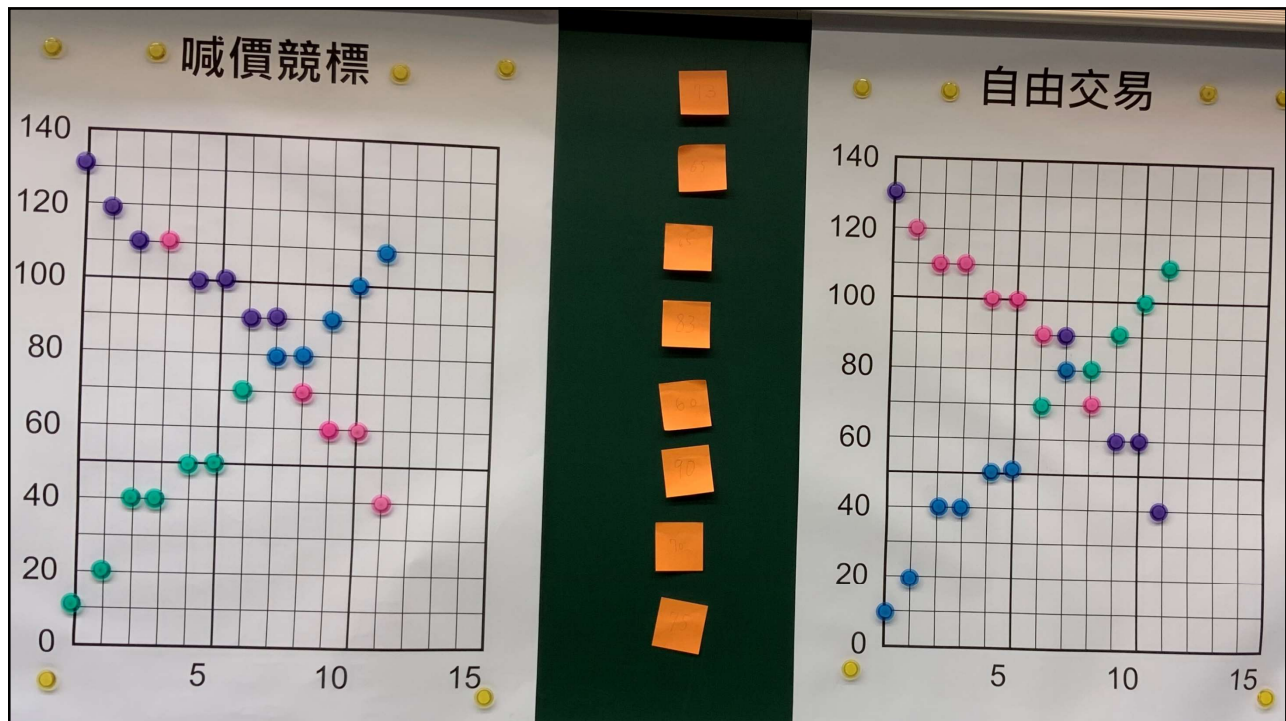
➤ How does the supply-demand model predict transaction? (學8: 供需理論如何預測成交價格?)



Does theory predict data well?

理論的預測能力如何? (學9)

Price (價格)? Quantity (數量)?



- What is the difference between free-form bargaining and open double auction?  
Does this lead to different outcomes?

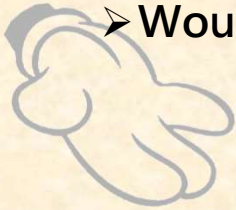
(學10: 「自由談判」與「喊價競標」這兩種交易制度有哪些不同之處? 會產生不一樣的結果嗎? 為什麼?)

➤ **Free-form Bargaining** (自由談判) → **Medieval Market** (古時候的市集)

➤ **Double Auction** (喊價競標) → **NYSE** (股市交易所)

- Would classroom layout affect market formation?

(教室場地會不會影響市集的形成?)



# The End

## (遊戲結束)

**Please count your Ecoins**

**(請結算自己的籌碼)**

**10Ecoins = 1 Point**

