Supplementary information
with

Student test performances on behavior of gas particles and mismatch of teacher predictions

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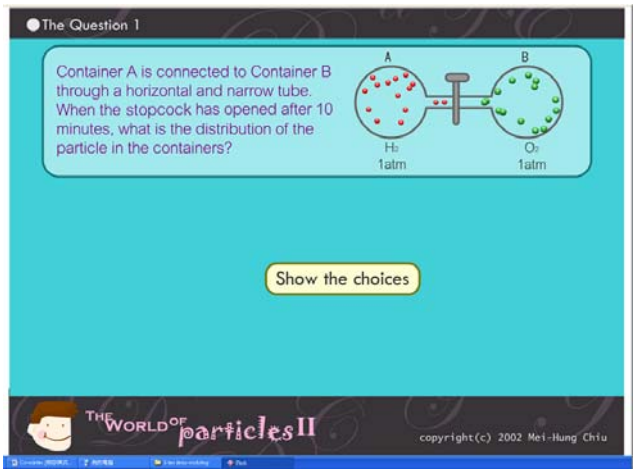
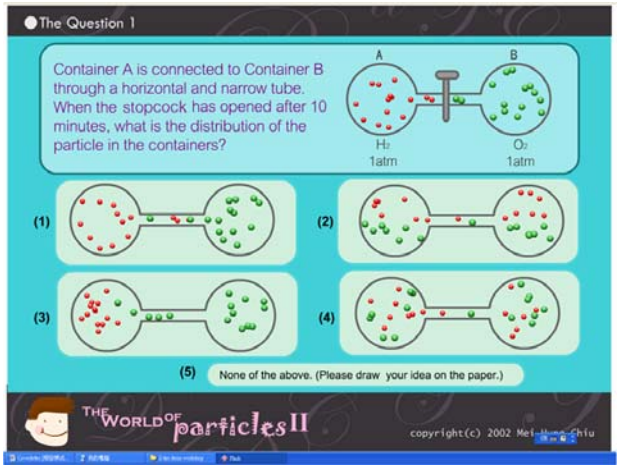
Test items used in this study

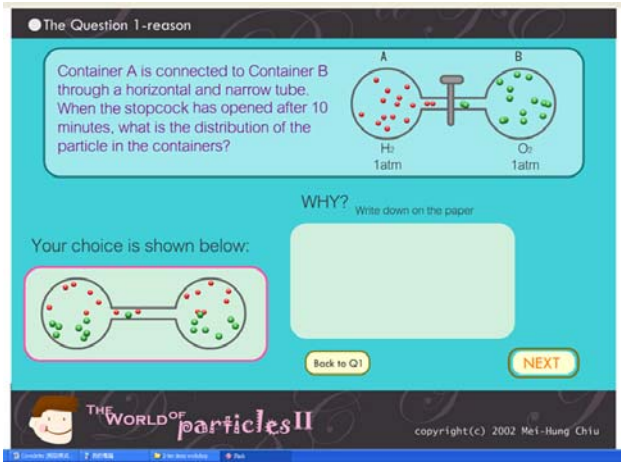
Step 1:



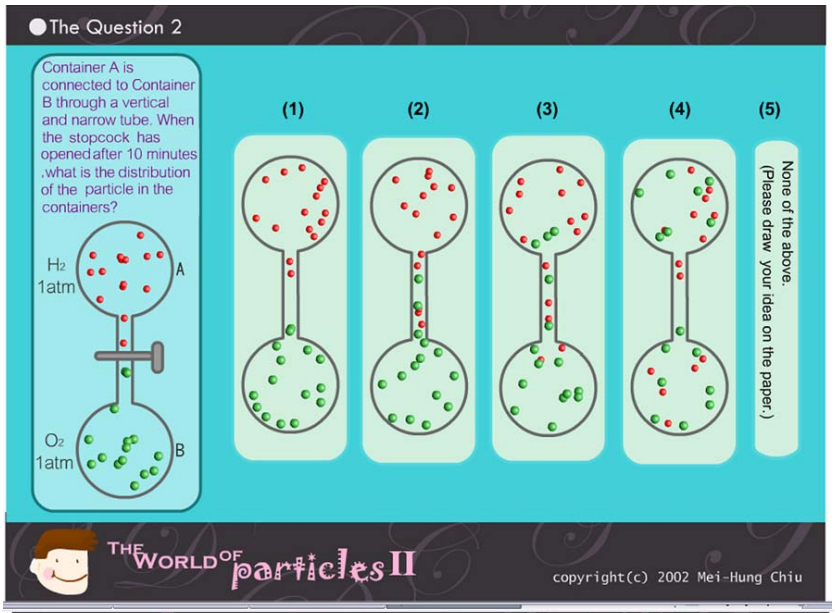
Step 2

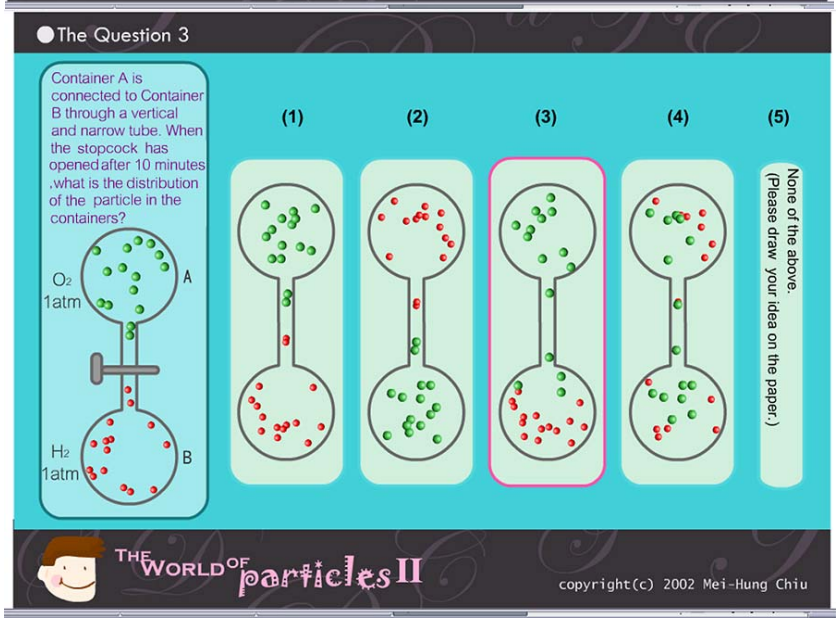


Step 3



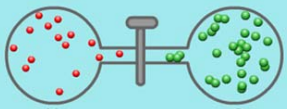
There were similar three steps for Items Q2-Q6, and therefore, we only present the second step as follows.

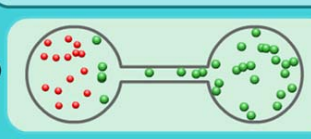


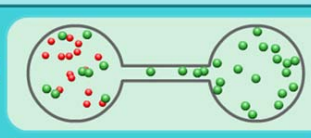


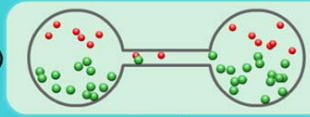
The Question 4

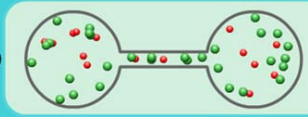
Container A is connected to Container B through a horizontal and narrow tube. When the stopcock has opened after 10 minutes, what is the distribution of the particle in the containers?



(1) 

(2) 

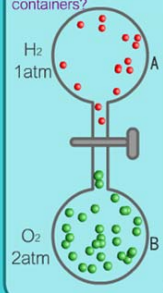
(3) 

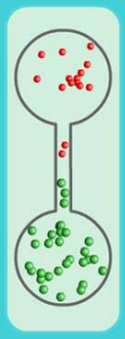
(4) 

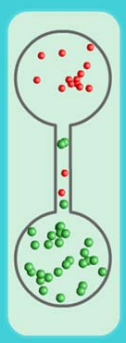
(5) None of the above. (Please draw your idea on the paper.)

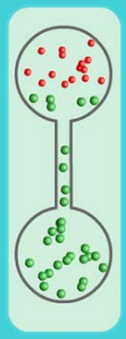
The Question 5

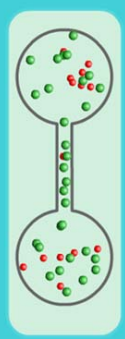
Container A is connected to Container B through a vertical and narrow tube. When the stopcock has opened after 10 minutes ,what is the distribution of the particle in the containers?



(1) 

(2) 

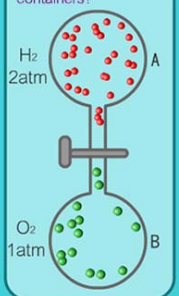
(3) 

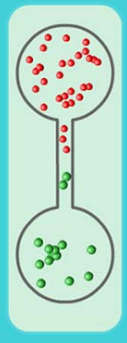
(4) 

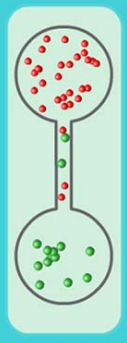
(5) None of the above. (Please draw your idea on the paper.)

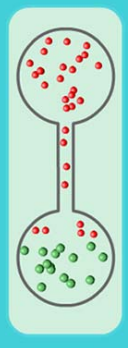
The Question 6

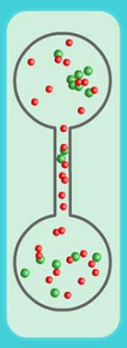
Container A is connected to Container B through a vertical and narrow tube. When the stopcock has opened after 10 minutes ,what is the distribution of the particle in the containers?



(1) 

(2) 

(3) 

(4) 

(5) None of the above. (Please draw your idea on the paper.)