

# A six-year old learning about seed growth to plants



6 year old using a loop film to study plant growth



# 6 year old studying the particulate nature of matter





A 12th grade child being interviewed about the nature of matter



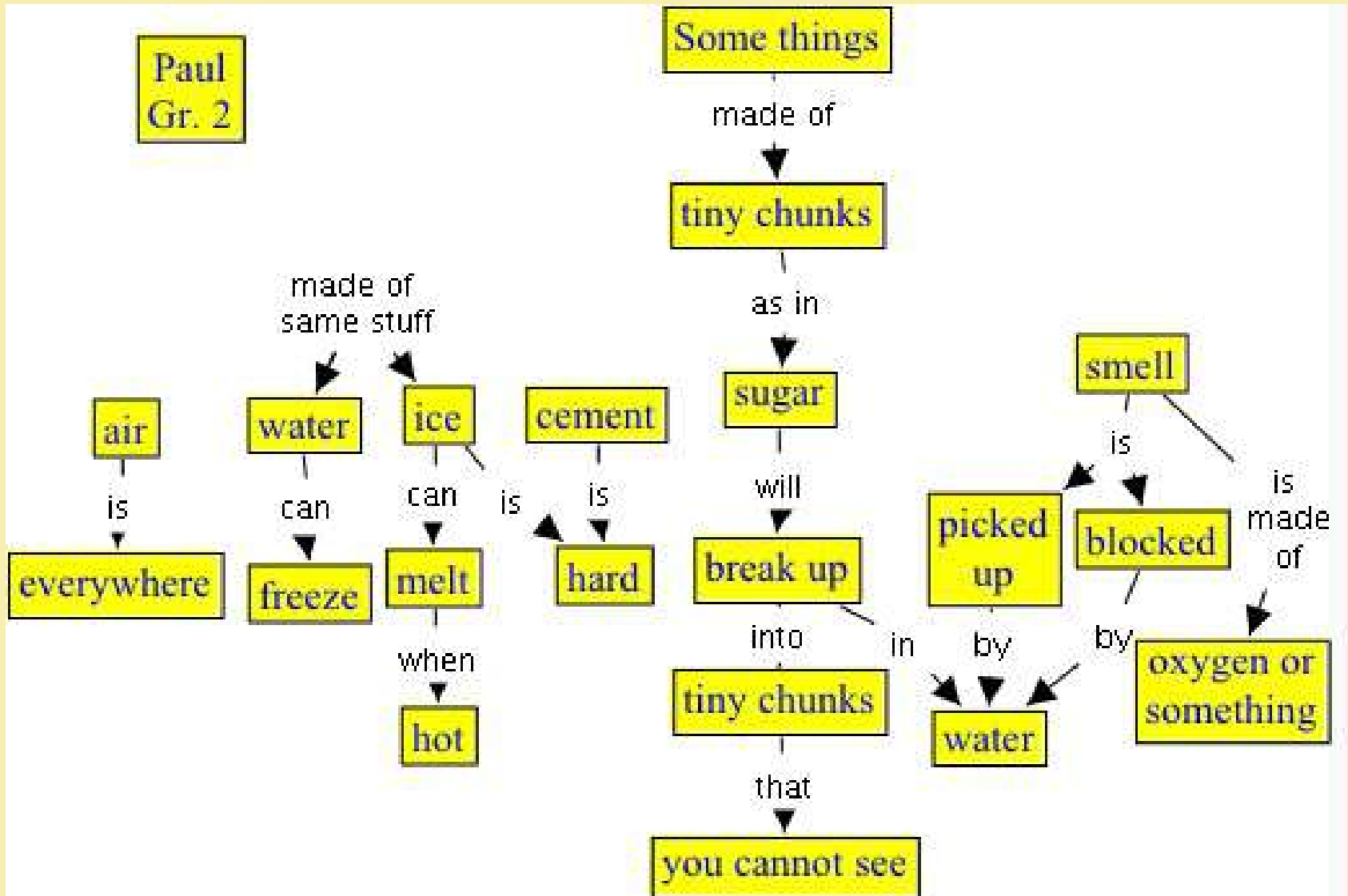
**Working with Ausubelian principles and constructivist epistemology, we found, in 1972, we could transform a 12-20 page interview transcript into a one page concept map more clearly representing the child's understandings.**

**Interview  
or  
transcript**

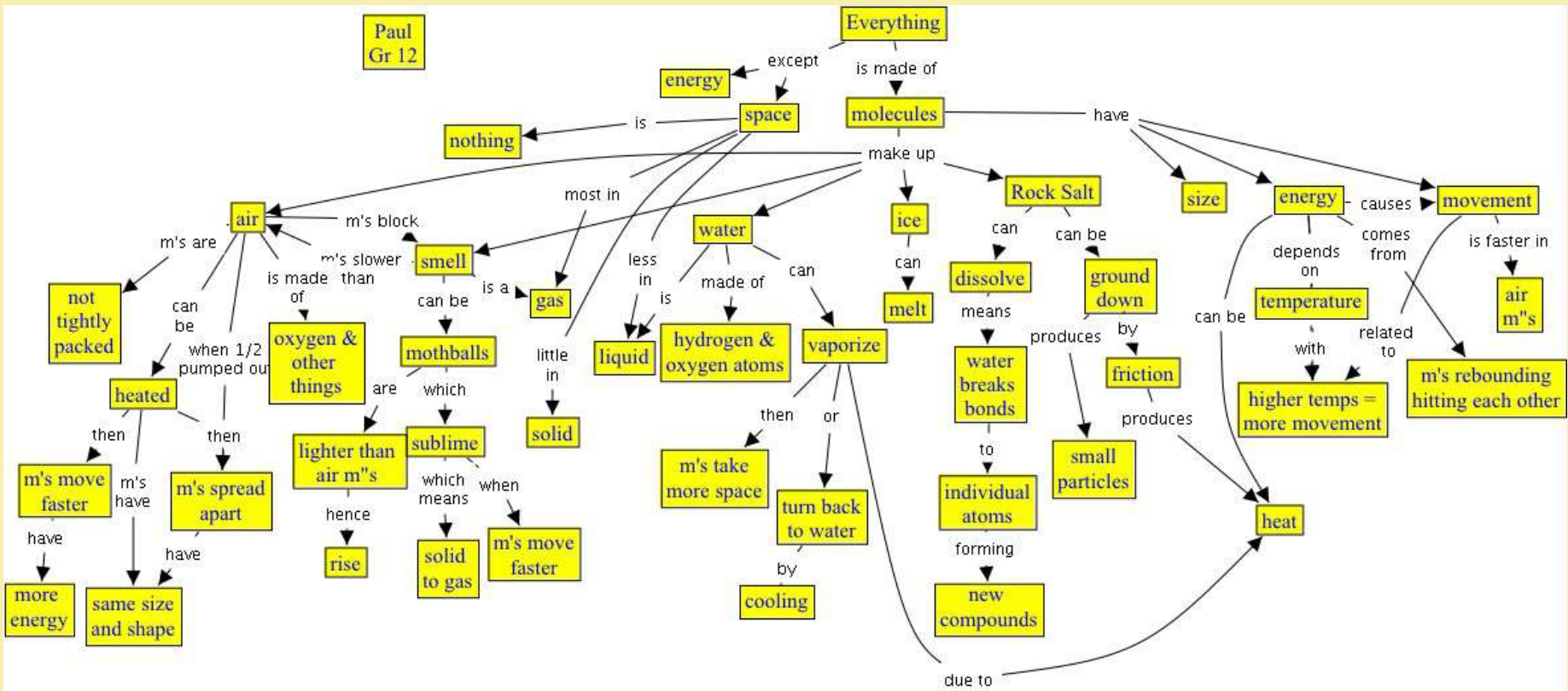


**Concept  
map**

# A concept map prepared for a 2nd grade child



# A concept map prepared from an interview with a 12th grade child





## **Successful interview requires:**

- **Skilled interviewer**
- **Good focus question(s)**
- **Use “wait-time”**
- **Use good props**
- **Listen to interviewee**
- **Use follow-up questions**

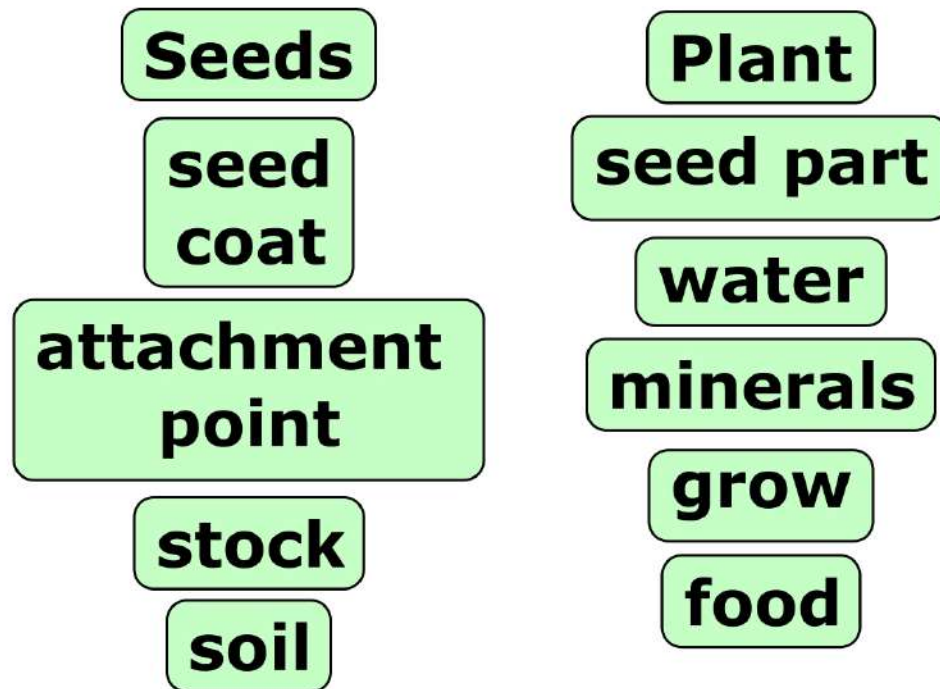
## Wynne interviewing a 3rd grade student about seeds



**Wynne interviewing a 3rd grade student about seed growth**

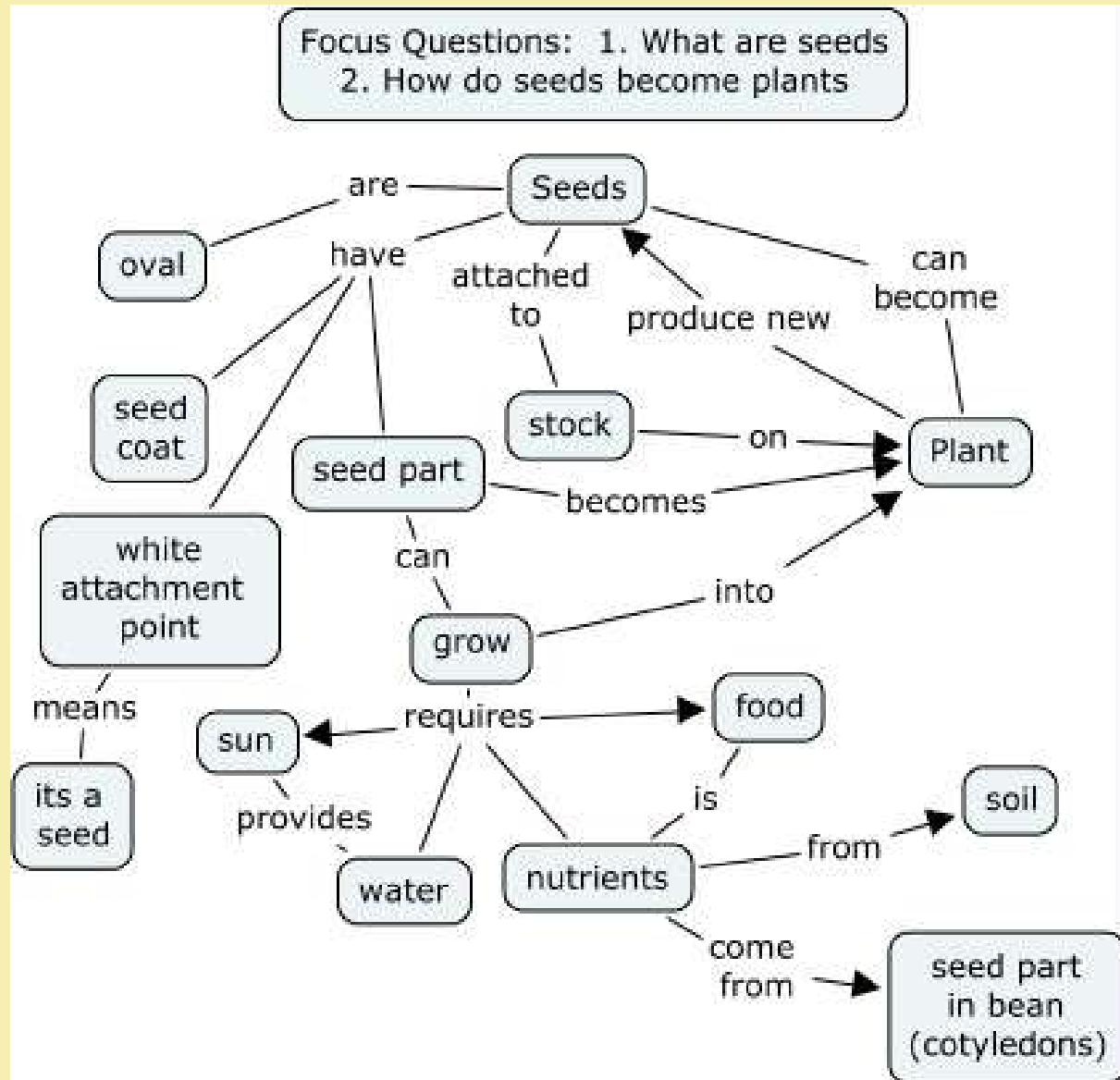
**Focus Questions: 1. What are seeds  
2. How do seeds become plants**

**"Parking lot" created from interview tape**



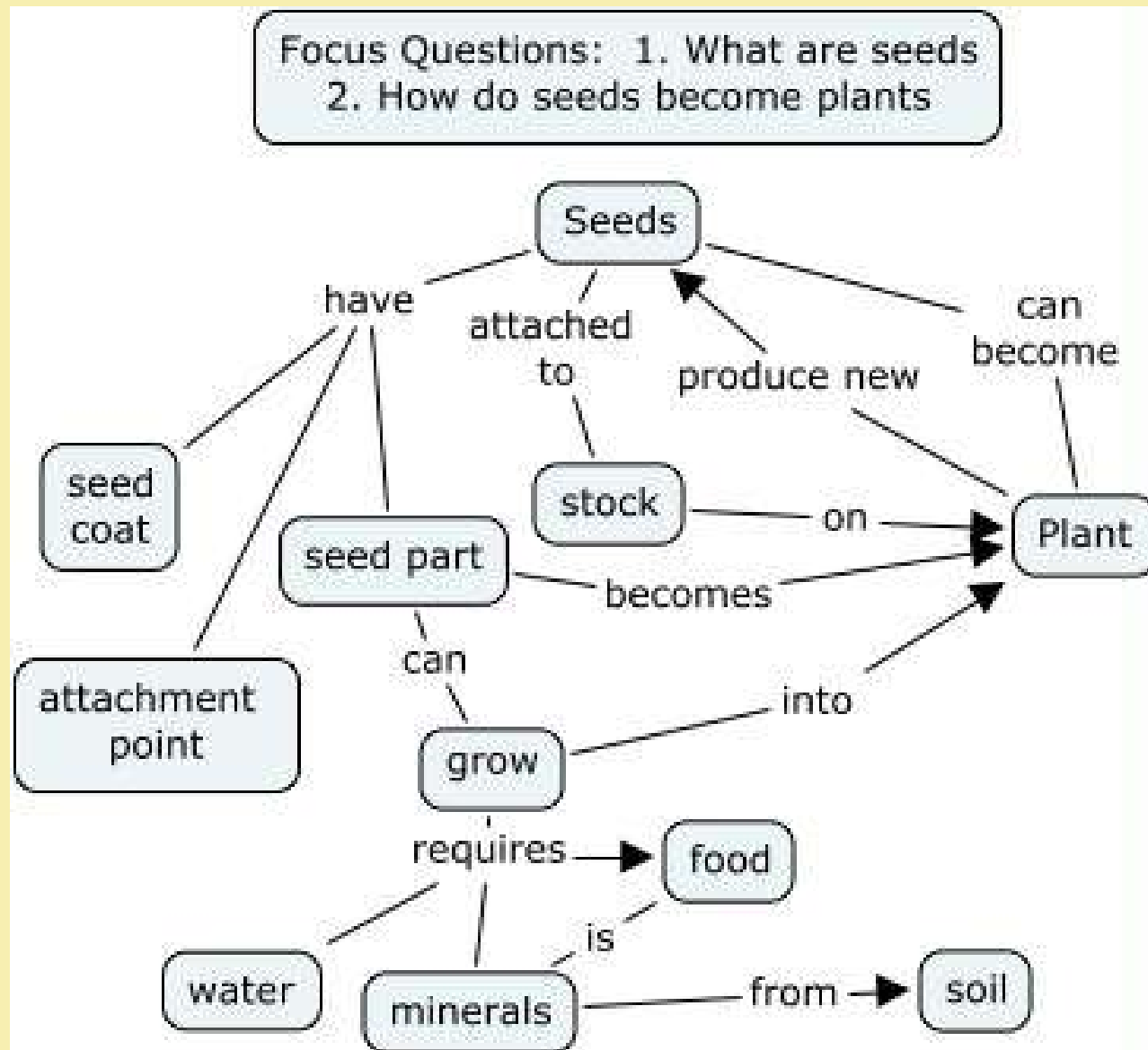
**Permits direct production of a concept map  
with a 2nd or 3rd review of interview tape**

# A concept map drawn from Wynne's interview with 3rd grader



# **Wynne interviewing a 4th grader about seeds**

# Concept map drawn from Wynne's interview with 4th grader



# Vygotsky's Zone Proximal Development (ZPD)

Maximum level of cognitive development that can be achieved at this time

where

Higher level of cognitive development not attainable even with coaching

Zone of Proximal Development where additional meaningful is possible with effort and/or coaching

Base level of cognitive development already attained on this topic

is

Level of understanding of a topic achieved from prior meaningful learning



**Wynne interviewing 4th grader about requirements for growth**

## **Some ideas the children are not ready to learn:**

- 1. Photosynthesis requires carbon dioxide, water, and light energy.**
- Growth of plants occurs with cell division.**
- 3. Structures of plants form as cells differentiate.**

**With a sequence of proper lessons, 6-7 year olds can learn about photosynthesis**

