

5. Researchers' Comments (English)

- [00:00:48](#) **Goal statements.** The teacher reminds students about what they did yesterday and tells them what they will be doing in today's class, as well as what they will be doing next week in biology. Providing goal statements is one way teachers can make the organization of the lesson more explicit for students. In the Netherlands, goal statements were present in 83% of all the lessons (Roth et al., 2006, *Teaching Science in Five Countries: Results from the TIMSS 1999 Video Study* [hereafter Video Report], figure 5.8).
- [00:02:20](#) **Going over homework and developing new content.** The teacher begins correcting the answers of the homework assignment about the structure of the heart (Basic Subject Matter Four), which takes about 10 minutes (until 00:14:09). During the time that the teacher is going over the homework assignment, she also takes the opportunity to explain new related concepts. Across all Dutch lessons, 12% of the lesson time was devoted to going over homework and 78% to developing new content (Video Report, table 3.4).
- [00:02:52](#) **Canonical knowledge.** The class identifies parts of the heart from the homework assignment. For question number 4, John provides the answer of pulmonary vein, which the teacher elaborates and says it ends up in the left atrium. This is an example of canonical knowledge, which includes information about scientific facts, concepts, ideas, processes, or theories. In the Netherlands, 85% of the lessons contained canonical knowledge during public talk (Video Report, figure 4.2).
- [00:04:40](#) **Visual representation.** The teacher uses a heart model to go over the circulatory system. The heart model is considered a visual representation used to highlight concepts and processes as well as the object itself. Eighty-one percent of the Dutch lessons had visual representations (Video Report, figure 6.1).
- [00:07:34](#) **Public discussion.** Here the teacher is asking a student for the name of the item that removes carbon dioxide and other waste products. The student answers (coronary veins), and the teacher provides an evaluation, "Yes, very good." This conversational exchange is an illustration of a classroom discussion. On average, 13% of science instruction time in the Dutch lessons was spent on public discussions (Video Report, figure 9.1).
- [00:14:09](#) **Textbooks.** At this point, the teacher directs students' attention to how the heart functions, a new section in the textbook (Basic Subject Matter Five). In the Netherlands, textbooks and/or workbooks were used more than in any of the other countries. Ninety percent of the Dutch lessons used textbooks and/or workbooks (Video Report, figure 11.2).
- Development of new content.** This is the beginning of the development of new content information, as signaled by the teacher. The total time spent developing new content in this particular lesson is 29.5 minutes, or 67% of the science instruction time. The Dutch average across all lessons was 78% (Video Report, table 3.4).
- [00:17:35](#) **Public presentation.** This two-minute segment represents a public presentation where the teacher is essentially lecturing. In the Netherlands, 35% of science instruction time

was spent on public presentations (Video Report, figure 9.1).

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Real-life issues. The teacher is connecting information about heart valves to a real-life situation in a hospital. She states that a doctor at a hospital uses a stethoscope to listen to the heartbeat, and more specifically, listens to the closing of the heart valves to check if they are closing properly. This type of information is considered to be a real-life issue. Seventy three percent of the Dutch lessons contained real-life issues (Video Report, figure 10.1).

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Self-pacing long-term assignments. The teacher instructs students to work on the assignment related to Basic Subject Matter Five and afterwards continue with Basic Subject Matter Six as indicated in their day planner/study guide. The day planner allows students to work at their own pace. In the Dutch data set, 52% of the lessons had students working at their own pace on long-term assignments (Video Report, figure 11.10).

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Independent seatwork activity. Students begin working on the assignments, which is considered to be an independent seatwork activity. On average, 28% of science instruction time in the Dutch lessons was devoted to independent seatwork activities (Video Report, figure 3.7).

Reading silently. Students have to read information about Basic Subject Matter Six (i.e., heart infarctions) before they can answer the set of questions. On average, 19% of the science instruction time was spent on silent reading (Video Report, figure 9.7).

Students generate written responses. In addition to reading text, students have to answer a set of open-ended questions that require them to write responses. The Dutch lessons showed that students spent more time generating written responses (36%) than selecting answers (6%) during independent seatwork (Video Report, figure 9.5).

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Non-science. Formal science instruction time has ended. Here marks the beginning of non-science. The teacher has informed the class that they will continue to work on Basic Subject Matter Six tomorrow. Students pack up their belongings and engage in various talk as they wait for the bell to ring. In the Netherlands, three percent of lesson time was attributed to non-science (Video Report, figure 3.2).