Timewise

Improving pupils' understanding of historical time in primary school

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Chapter 4

“EVERYTHING WAS BLACK AND WHITE . . .” PRIMARY SCHOOL PUPILS’ NAIVE REASONING WHILE SITUATING HISTORICAL PHENOMENA IN TIME

The understanding of historical time is an important aim in primary school history education. This study focuses on problems pupils encounter in their reasoning, when carrying out assignments on placing historical phenomena in time. The context is the Dutch curriculum with ten eras and characteristic features, which was implemented to support pupils in orientating themselves in time. Twenty-two pupils of grades 3 to 8 (ages 6-12) conducted assignments in which they had to place objects, situations, events and people in time. These assignments were based on the objectives on the understanding of historical time. Results confirmed problems that had been described in previous studies, but some other problems were identified as well. These problems were related to the names and icons and characteristic features of the ten eras, which sometimes helped, but sometimes also hindered pupils in their reasoning. Awareness of these problems is helpful for the development of a pedagogy to improve pupils’ understanding of historical time. The study concludes with implications for teachers, teacher trainers and policymakers.

4.1 INTRODUCTION

The concept of the understanding of historical time is often restricted to ‘chronology’. However, understanding historical time is more than chronology, which in its strictest sense only refers to the arrangement of events or dates in the order of their occurrence. Next to an understanding of dates and knowing the names and sequence of historical eras, the understanding of historical time also involves knowledge and understanding of events and changes in the past, and of change and continuity within and between periods (Stow & Haydn, 2000; Wilschut, 2012). This understanding includes knowledge of characteristics of different historical eras and how people lived in those eras, which is also referred to as ‘a sense of period’ (Dawson, 2004). In our rapidly changing society with numerous technological developments, the understanding of historical time becomes increasingly important to help children with the interpretation of constantly available information about contemporary and historical events and changes.

However, evaluations indicate that the teaching and learning of historical time in primary schools is not always optimal (Wagenaar, Van der Schoot & Hemker, 2010; Ofsted, 2011). Although there are some older studies on teaching programs about the understanding of historical time for primary pupils (Blyth, 1978; West, 1981a; Hodkinson, 2003a), little still is known about problems that pupils might encounter while situating historical phenomena in time. Knowledge about problems that arise in these kinds of

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assignments could help to gain more insight into how pupils develop their understanding of historical time.

This study is part of a more comprehensive study in which a large group of Dutch primary pupils carried out a paper and pencil test, which concluded that pupils’ performances on the understanding of historical time increased through grade 3-8 (De Groot-Reuvekamp, Ros, Van Boxtel, & Oort, 2017). In the present study we want to focus on problems in pupils’ reasoning in the Dutch context.

4.2 THEORETICAL FRAMEWORK

4.2.1 Pupils’ reasoning on events, people and changes through time

In a previous study (De Groot-Reuvekamp et al., 2017) five objectives for primary school pupils’ understanding of historical time were defined: Pupils learn to:
1. Apply the vocabulary relating to time and periods of time.
2. Identify characteristic features in texts and images to place objects, situations, events and people in the correct periods of time.
3. Place objects, situations, events and people on a timeline.
4. Identify changes, differences and similarities in the way people lived within and across periods.
5. Sequence objects, situations, events and people of different periods of time in chronological order.

A small body of empirical studies describes primary school pupils’ development on some of these objectives (Levstik & Pappas, 1987; Harnett, 1993; Barton & Levstik, 1996; Hoge and Foster, 2002). For instance, pupils’ understanding of the vocabulary of time develops from the use of relative time phrases, such as ‘long ago’ and ‘very long ago’, to names of historical eras, dates AD and BC and centuries. Identifying characteristic features of historical periods develops from concrete everyday life characteristics, such as clothing, transport and architecture, to more abstract characteristics such as social and cultural characteristics and economic and political structures.

In a number of empirical studies researchers have investigated primary pupils’ reasoning while working on tasks about sequencing and dating, with pictures, stories or artifacts (Levstik & Pappas, 1987; VanSledright & Brophy, 1992; Harnett, 1993; Brophy, VanSledright, & Bredin, 1993; Barton & Levstik, 1996; Wood & Holden, 1997; Vella, 2001; Foster, Hoge & Rosch, 1999; Hoge & Foster, 2002; Hoodless, 2002; Blow, Lee & Shemilt, 2012). Although these studies predominantly focused on what pupils between the ages of 5 and 12 did well, they also shed some light on problems that pupils encountered in their reasoning on events, people and changes through time. With regard to sequencing pictures of situations about daily life in different historical periods, most pupils of all ages performed these tasks more or less correctly, but their reasoning on justifying their choices showed three types of problems.

Firstly, the use of dates appeared to be difficult for the youngest pupils (Barton and Levstik, 1996). Since pupils in grades 3-5 are still learning the meaning of numbers, it is no surprise that these pupils have problems in applying dates. For instance, Barton and Levstik
(1996, p.435) indicate that younger “pupils sometimes did not understand that dates in the past are smaller than the present date or that dates from later in time must be larger than those longer ago”. Especially pupils in grades 3-5, but also older pupils, often used broad time phrases like ‘long ago’ and ‘very long ago’ (Levstik & Pappas, 1987; Harnett, 1993; Barton & Levstik, 1996; Foster et al., 1999; Hoge & Foster, 2002). The use of these broad time phrases can be problematic, as Hodkinson (2003b) described, because pupils can have very different interpretations of these terms. Pupils in grades 6-8 understood the arhythmic meaning of dates (Barton & Levstik, 1996) and more often used dates and names of historical periods. However, they often lacked the historical knowledge to apply dates accurately (Foster et al., 1999; Hoge & Foster, 2002).

The second type of problems relates to applying knowledge of characteristics of historical periods. As could be expected, older pupils more often applied historical knowledge than younger pupils (Barton & Levstik, 1996; Foster et al., 1999; Hoge & Foster, 2002). However, older pupils did not always apply their knowledge accurately either, as was reported for instance by VanSledright and Brophy (1992), who found that pupils often mixed accurate historical information with naive conceptions and imaginative elaborations. An example is a fifth-grade pupil, explaining how Columbus discovered America together with “another guy, a pirate or something . . .” who found it first and after whom America was named (VanSledright & Brophy, 1992, p. 845-846). Also Wagenaar and Hemker (2004, p. 111) found that pupils in grade 8 (ages 11-12) sometimes tried to compensate their lack of knowledge with ‘speculations and phantasies’. Furthermore, pupils’ reasoning when identifying characteristics in pictures was sometimes affected by the type of source, as for instance with regard to a picture with an artists’ impression of a dinosaur, on the basis of which a 7-year old pupil reasoned that dinosaurs are very old, but that the picture did not look old at all (Harnett, 1993).

Thirdly, with regard to comparing pictures from different historical periods, pupils in the studies mentioned above regularly compared historical situations with their present-day experiences, by identifying characteristics in present-day society that were ‘not yet’ present in ‘earlier times’, assuming that history is a linear story of progression (Harnett, 1993; Barton & Levstik, 1996; Hoge & Foster, 2002). Present-oriented thinking, or presentism, could lead pupils to think of people in present times as superior (Hunt, 2002) and people in the past as stupid (Lee & Ashby, 2001). This kind of reasoning, in which the past is judged from a contemporary perspective, can cause misconceptions about the past. In several of the studies mentioned above pupils demonstrated these kinds of misconceptions, for instance in reasoning that black-and-white pictures and appearances as ‘dirty’ or ‘broken’ must be older than coloured pictures and bright shiny artefacts (Harnett, 1993; Barton & Levstik, 1996; Foster et al., 1999; Vella, 2001; Blow et al., 2012).

From literature can be concluded that in pupils’ reasoning, while accounting for their choices in sequencing and dating, several problems arose with regard to the components of the understanding of time: problems in using the vocabulary of time, problems in identifying characteristic features of historical eras, and problems resulting from present-oriented thinking in comparing historical periods with each other and the present. There are hardly any studies that focus on problems in placing historical phenomena on timelines, which is also part of the developmental model on the understanding of historical time. In a study of De Groot-Reuvelkamp et al., (2017) two different kinds of timelines were used. For the items in which pupils placed phenomena on a timeline with only the names of eras, the number of correct answers increased through grades 3-8 from 33% to 84% (Table 3.3). For phenomena
that had to be placed in periods of time on a timeline with dates and without the names of eras, correct answers for grades 5-8 ranged from 22% to 41% (Table 3.4). These findings indicate that pupils found it hard to relate phenomena that are characteristic for certain eras to periods of time on the timeline. This is remarkable, because a new curriculum for history was introduced in the Netherlands during the last decade, with a framework of ten eras and characteristic features to support pupils in placing historical phenomena in time. The next section elaborates on the renewal of the Dutch history curriculum.

4.2.2 The Dutch curriculum: a chronological framework of orientation knowledge

The present curriculum for history in Dutch primary and secondary education was implemented in 2006, in response to a public debate about history education failing to provide pupils with factual knowledge and chronological understanding (Van Drie, Logtenberg, & Riessen, 2009; Wilschut, 2010; Klein, 2010; Van Boxtel & Grever, 2011). This curriculum aims to improve pupils’ understanding of historical time through the introduction of a framework of ten eras with symbolic icons and ‘easy to remember’ associative names, such as the Era of Cities and States (Late Middle Ages) and the Era of Regents and Princes (17th century) (Commission on History and Social Sciences, 2001). For each era characteristic features are described, with a total of 49 characteristics, of which 20 apply for primary education. Examples of characteristic features for primary education are ‘the emergence of agriculture and agricultural communities’ in the era of Hunters and Farmers and ‘the striving for fundamental rights and political influence of citizens in the French and Dutch revolutions’ in the era of Wigs and Revolutions. The majority of the 20 characteristics that apply for primary education have a political or economic perspective (See Appendix 4.1 for the names of all ten eras, with 20 characteristic features). These characteristic features are meant to be a frame of reference, which supports pupils to orientate themselves in time. They contain no specific names of persons or events, because the idea is that teachers and pupils themselves can think about meaningful and significant events that relate to the characteristics of eras. For example, for one pupil, knowledge about the Reformation can be illustrated with Luther or Calvin, whereas another pupil might use Zwingli or Erasmus, or yet another reformer. These kinds of examples should function as ‘coat pegs’ with which pupils can remember to which era certain phenomena belong (Commission on History and Social Sciences, 2001). In addition to this predominantly European framework with ten eras and characteristic features, a historical-cultural canon was developed, consisting of a list of fifty events and persons in Dutch history, which can be used to illustrate the eras (Van Oostrom, 2007). Some examples from this Dutch canon are: The Roman *limes*, Charlemagne, William of Orange, Rembrandt, Slavery, World War I and II, and Anne Frank. Both the ten-era framework and the Dutch canon are part of the core objectives in primary and secondary education (Dutch Ministry of Education, Culture and Sciences, 2006, 2010). In most primary schools the teaching of the history curriculum starts from grade 5 or sometimes 6, at the ages of 8 or 9.

There are some indications that pupils at the end of primary school could more often correctly place historical events on a timeline after the introduction of the ten era framework. However, it is not clear whether this framework really leads to improvement in pupils’ understanding of historical time (Wagenaar et al., 2010; De Groot-Reuvekamp et al., 2014).
4.2.3 Research question

The present study addresses the following research question: ‘Which types of problems related to the objectives of the understanding of time arise in Dutch primary school pupils’ reasoning while placing historical phenomena in time?’

4.3 METHOD

To answer the research question we investigated pupils’ reasoning in interviews with assignments that focused on the objectives of the understanding of historical time (De Groot-Reuvekamp et al., 2017). In these assignments, pupils aged 6-12 had to place pictures and stories of objects, situations, events and people in time. To make them feel more at ease and to give them the opportunity to interact, discuss and respond to each other’s answers, the pupils were interviewed in pairs. In this way it is expected that pupils show more elaborated reasoning than in individual interviews (Seixas, 1993; Barton, 2001). Although group interviews make it more difficult to identify characteristics of individual pupils, we did not consider this to be a problem, since the purpose of this study was not to quantify correct answers of each pupil.

4.3.1 Participants

The participants in this study were twenty-two pupils from grades 3-8 (ages 6-12) in two primary schools in smaller cities in the South-East of the Netherlands. For both schools teachers of each grade were asked to select two pupils, representing the average performance in their classrooms. For school A, no pupils of grade 8 participated, because at the moment that the interviews were conducted, both selected pupils were not in school. In total 14 girls and 8 boys participated in the interviews (Table 4.1).

Table 4.1. Participating pupils, with age and gender (n = 22)

<table>
<thead>
<tr>
<th>Grade</th>
<th>School A</th>
<th>School B</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>Nora (7,f) and Samira (7,f)</td>
<td>Fiona (6,f) and Charlie (7,m)</td>
</tr>
<tr>
<td>4.</td>
<td>Ruby (7,f) and Simon (8, m)</td>
<td>Mandy (7,f) and Paula (8,f)</td>
</tr>
<tr>
<td>5.</td>
<td>Gemma (9,f) and Theo (9,m)</td>
<td>Alice (9,f) and Felicia (9,f)</td>
</tr>
<tr>
<td>6.</td>
<td>Mira (10,f) and Gino (10,m)</td>
<td>Kevin (10,m) and Kai (10,m)</td>
</tr>
<tr>
<td>7.</td>
<td>Jessie (10,f) and Jade (11,f)</td>
<td>Lucy (11,f) and Pearl (10,f)</td>
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<tr>
<td>8.</td>
<td></td>
<td>Mike (12,m) and Luke (12,m)</td>
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</table>

*Note.* f = female; m = male

For each participating pupil, parental consent was asked and received for their children to take part in the interview and for the video recording. The names in Table 4.1 are pseudonyms. In both schools history featured in the curriculum for grades 5 to 8, with weekly lessons of about one hour per week. History did not feature in the curricula for grades 3 and 4. The schools are representative in teaching history with a chronological approach (De Groot-Reuvekamp et al., 2014). School A taught weekly history lessons in grades 5-8 with a textbook, based on the ten eras and the characteristic features in which all eras featured twice: in grades 5 and 6 and again, more in depth, in grades 7 and 8. School B
used a program with a thematic, integrated approach for history, geography and science, next to weekly lessons on the Dutch canon, in grades 5-8, in combination with timelines with the ten eras. All windows of the canon were taught two times, in grades 5-6 and again in grades 7-8.

4.3.2 Assignments in interviews

The assignments in the interviews (Table 4.2) were based on the five objectives in pupils’ understanding of historical time (De Groot-Reuvenkamp et al., 2017), and increased in difficulty with regard to the use of vocabulary, the concreteness of characteristic features and the complexity of the timelines. Table 4.2 presents an overview of the assignments that were used in the interviews. Assignments 1-14 were carried out by pupils of grades 3 and 4 (ages 6-8), assignments 1-24 by pupils of grades 3 to 5 (ages 6-9), and assignments 9-40 by pupils of grades 6 to 8 (ages 9-12).

Most assignments contained pictures that represented elements of characteristic features of the ten eras and the Dutch canon. These pictures were carefully selected from educational and museum websites. Next to the names of the ten eras, traditional names of historical periods were used, such as Prehistory, Middle Ages and Golden Age, in some assignments, because these terms are often used in everyday language and also in history textbooks, next to the names of the ten eras.

For pupils in grades 3-5, assignments 1 to 8 concerned the placing in time of concrete objects and situations from everyday life, such as toys, writing devices and living rooms, with sets of three pictures, with questions such as: Which toy is the oldest? Which living room is from long ago and which one longest ago? Assignments 9 to 12 were about the chronological sequence of sets of three pictures with concrete characteristics, such as classrooms or means of transport, with questions such as: What is the correct sequence, when you start with the oldest picture?

Furthermore, there were assignments on the understanding of dates AD (13 and 14), in which pupils, for example, had to identify which child from three children in one family was the oldest or the youngest, from their years of birth. Assignments 15 to 24 consisted of pictures and little stories about different social and cultural characteristics of eras, which had to be placed in the correct historical era on a simple timeline with only three eras with icons, but no dates.

Pupils in grades 6-8 also carried out assignments 9 to 12 on chronological sequences, dates AD and social and cultural characteristic features. In addition these pupils were asked to place some pictures in one of three timeframes on a timeline with only dates AD and no names of eras (25-28). Furthermore, these pupils carried out assignments on the understanding of dates AD and BC by identifying the oldest or most recent picture from sets of three pictures, such as coins or ships with given dates (29-31). Assignments 32 to 34 were about identifying the correct century of a historical event to which the date was given. Finally pupils were asked to place stories and pictures about economic and political characteristics of eras on a timeline with dates and the names and icons of the ten eras.

The interviews were conducted by the first researcher. The interviewer read all assignments aloud and asked the pupils to choose an answer from three options. Subsequently, the interviewer asked the pupils to elaborate on their answers, by probing with questions such as: “Why do you think so?”, “Do you agree?”, “Why / why not?”, “How can you see that?”, “What makes you think so?”, and “How long ago do you think this was?” The interviews lasted about 30 to 45 minutes.
<table>
<thead>
<tr>
<th>Assignments</th>
<th>Objectives</th>
<th>Pictures / stories</th>
<th>Questions asked</th>
<th>Grades</th>
<th>Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Toys</td>
<td>1) Time vocabulary: relative terms relating to time.</td>
<td>Sets of three pictures.</td>
<td>Which picture represents an object from the past, the present, from long ago, very long ago?</td>
<td>3-5</td>
<td>6-9</td>
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<tr>
<td>2. Ships</td>
<td>2) Characteristic features: Concrete characteristics of everyday life.</td>
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<td>3. Women’s clothes</td>
<td>4) Compare and contrast.</td>
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<tr>
<td>4. Boiling water</td>
<td>5) Chronological sequence.</td>
<td>Three rows of three pictures.</td>
<td>What is the correct chronological sequence?</td>
<td>3-8</td>
<td>6-12</td>
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<td>5. Writing devices</td>
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<td>6. Living rooms</td>
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<td>7. Kitchens</td>
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<td>8. Goblets</td>
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<td>9. Classrooms</td>
<td>4) Compare and contrast.</td>
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<td>10. Transport</td>
<td>5) Chronological sequence.</td>
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<td>11. Buildings</td>
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<td>12. Women</td>
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<td>13. Children</td>
<td>1) Time vocabulary: Dates AD.</td>
<td>Names with dates. No pictures. Pictures with names and dates.</td>
<td>Which person is the oldest / youngest?</td>
<td>3-8</td>
<td>6-12</td>
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<td>14. Historical persons</td>
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<td>15. Hunters and Farmers</td>
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<td>16. Anne Frank</td>
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<td>17. Roman stadium</td>
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<td>18. Knights on Bayeux Tapestry</td>
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<td>19. Reindeer hunters</td>
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<td>20. Painting of Vermeer</td>
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<td>21. Steam factory</td>
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<td>22. Columbus</td>
<td></td>
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<td>23. Roman Aqueduct</td>
<td></td>
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<td>24. Neil Armstrong</td>
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<td>25. Classroom</td>
<td>3) Use of a timeline with dates AD.</td>
<td>One picture with a choice from three marked timeframes.</td>
<td>To which timeframe does this picture belong?</td>
<td>6-8</td>
<td>9-12</td>
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<tr>
<td>26. Transport</td>
<td></td>
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<td>27. Building</td>
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<td>28. Woman</td>
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<tr>
<td>29. Roman coins</td>
<td>1) Time vocabulary: Dates BC.</td>
<td>Three pictures with dates.</td>
<td>Which picture represents the oldest coin, building, ship?</td>
<td>6-8</td>
<td>9-12</td>
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<tr>
<td>30. Buildings</td>
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<td>31. Ships</td>
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<td>32. Television</td>
<td>1) Time vocabulary: Centuries.</td>
<td>A picture with a short description and a date.</td>
<td>In which century did this happen?</td>
<td>6-8</td>
<td>9-12</td>
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<tr>
<td>33. Mediaeval castle</td>
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<td>34. The euro</td>
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<td>35. Charlemagne</td>
<td>2) Characteristic features: mostly economic and political (more abstract).</td>
<td>A picture with a short description and a choice from three timeframes.</td>
<td>In which era did this happen?</td>
<td>6-8</td>
<td>9-12</td>
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<tr>
<td>36. The French Revolution</td>
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<td>37. Great depression</td>
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<td>38. Medieval crane</td>
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<td>39. Flourishing trade in Amsterdam</td>
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<td>40. Abolition of slavery</td>
<td>3) Use of timelines with dates and names and icons of the ten eras.</td>
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</tr>
</tbody>
</table>
4.3.3 Data analysis

Eleven interviews were recorded and transcribed. The units of analysis were the answers that were given by pairs of pupils in the assignments. From 274 answers, 168 answers were selected in which pupils’ reasoning became visible, because they explained or discussed their answer. The answers that contained hardly or no verbalization of pupils’ thinking and reasoning were excluded.

The first author started with open coding of problems in pupils’ reasoning. The codes were discussed with the co-authors in an iterative process of re-examining the data and refining the codes. The final codes are presented in Table 4.3. Firstly the codes were compared to the problems found in literature about the vocabulary of time, knowledge about characteristic features and present-oriented thinking (Levstik & Pappas, 1987; VanSledright & Brophy, 1992; Harnett, 1993; Barton & Levstik, 1996; Foster et al., 1999; Vella, 2001; Hoge & Foster, 2002; Blow et al., 2012).

Based on the literature, codes were distinguished for problems with relative time phrases, problems with meaning of dates, and problems with lack of knowledge about characteristic features of eras. Furthermore expressions of presentism were coded: such as dirty or broken appearances, characteristics that were ‘not yet’ present, black-and-white versus coloured pictures and the type of picture (photo, drawing or painting). Subsequently, based on our data, the codes were expanded with problems that frequently appeared in pupils’ answers: problems with names of historical eras and centuries, problems with the timeline, problems with characteristic features, and names and icons of eras in the Dutch curriculum and economic and political characteristic features, which appeared more problematic than social and cultural characteristics. Extra codes for expressions of presentism were added: the present being more beautiful, richer, posh and real, and the past being weird, and reasoning that people could ‘not yet’ use electricity or other materials than for example wood or stone. Citations were marked that were illustrative for the coded problems.

The final codes and the relation to the objectives on the understanding of historical time are presented in Table 4.3. For the objective on sequencing historical phenomena in historical order, no specific problems were found, but in their reasoning on justifying the sequences, pupils encountered problems related to the other objectives, for instance, with identifying characteristic features or presentism in comparing different pictures with each other. We included some examples of the coding in Appendix 4.2.
Table 4.3. Coding scheme with problems and sub-categories for pupils’ reasoning when placing historical phenomena in time

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Problems</th>
<th>Sub categories and descriptions</th>
</tr>
</thead>
</table>
| 1. Vocabulary of time  
Apply the vocabulary relating to time and periods of time. | Relative time phrases  
Meaning of dates  
Meaning of centuries  
Meaning of names of eras | Pupils use relative time phrases for different periods and durations, e.g. very long ago.  
Pupils relate the lowest date to the most recent event.  
Pupils do not know how to pronounce dates.  
Pupils confuse dates AD and BC. |
| 2. Characteristic Features  
Identify characteristic features in texts and images to place objects, situations, events and people in the correct periods of time. | Lack of knowledge about curricular characteristic features | Pupils reason with the names or icons of eras, instead of curricular characteristic features.  
Pupils mix up characteristics from different eras.  
Pupils find it more difficult to apply knowledge of economic and political characteristic features of historical periods than social and cultural characteristics. |
| 3. Timeline  
Place objects, situations, events and people on a timeline. | Lack of knowledge about the position of historical eras on the timeline | Pupils make intuitive guesses for placements of a phenomenon in an era on the timeline.  
Pupils guess for the dates that relate to an era on the timeline.  
Pupils start from what they assume would be incorrect, and select the era left over. |
| 4. Compare and contrast  
Identify changes, differences and similarities in the way people lived within and across periods. | Presentism: progress is assumed in:  
- people’s intelligence and use of materials  
- appearance of objects / devices | Pupils reason that people get smarter in the course of time.  
Pupils reason that people could ‘not yet’ use electricity or other materials than for example wood or stone.  
Pupils reason that objects of the present are more beautiful, richer, posh and real.  
Pupils reason that objects of the past are weird, dirty, broken, worn-down, and old-fashioned. |
| 5. Sequence  
Sequence objects, situations, events and people of different periods of time in chronological order. | Characteristics of pictures are confusing  
Naive reasoning as in 1 to 4 | Pupils assume that black and white and grey or brown pictures are older than coloured ones.  
Pupils assume that photos are more recent and more real than drawings or paintings. |
Chapter 4

4.4 RESULTS

The problems in pupils’ reasoning in assignments on placing objects, situations, events and people in time are presented in Table 4.3, categorized according to the objectives on the understanding of historical time. The results for each objective are presented below. The numbers between brackets refer to the assignments in Table 4.2.

4.4.1 The vocabulary of time

In answering assignments 1-12, grade 3-5 pupils could easily identify which pictures showed objects or situations from the past, the present, from long ago or very long ago. In their reasoning, grade 3 pupils rather often used different terms of relative time vocabulary, such as ‘in the past’, ‘now’, ‘old’, ‘older’, ‘very old’, ‘new’, ‘newer’, ‘a little bit newer’, ‘super old’ or ‘new’. In grades 4 and 5 this vocabulary became more differentiated, with terms as ‘just new’, ‘pretty old’, ‘more modern’, ‘less or a little bit modern’, ‘a little bit later’, and ‘very, very, very long ago’. However, these pupils sometimes had different associations with these terms, as for instance Charlie, grade 3, told about a picture of a Viking ship (2): “The Vikings were very long ago. I think that my father and mother were not yet there, because my father is already forty” and Paula, grade 4, with regard to a picture of 19th century toys (1): “The past is a very long time ago, for example three years ago or ten years ago”. Gemma and Theo, grade 5, found the picture of the Parthenon in the sequencing assignment of buildings (11), “very, very old, maybe 900 or 1000 years”.

The meaning of dates appeared to be difficult for grade 3-5 pupils, as in assignment 13, where they had to decide which one of three children, born in 2003, 2005 and 2007, was the youngest. Most pairs had discussions about the correct answer, because one of the pupils thought that the lowest date belonged to the youngest child, as Ruby (grade 4), who reasoned that a child who was born in 2003 would be younger than a child born in 2007. For grade 6-8 pupils, only one grade 7 pupil made this mistake. The big numbers of dates appeared to be difficult for grade 3-5 pupils. Theo, grade 5, for instance dated the Second World War about “ten thousand nine hundred ninety six, or nineteen...?” Occasionally, grade 6-8 pupils used expressions for decades, as Mira, grade 6, who recognized a photo of a classroom (10) as “from the fifties” and a photo of cars and trams (10) as “from the thirties”.

For the interpretation of dates BC (29-31) several grade 6 and 7 pupils initially were confused with regard to identifying the oldest of three Roman coins (116 AD; 53 AD; 103 BC). However, when asked by the interviewer to have a good look at the dates, they mostly corrected themselves. However, for the interpretation of the dates of three ships (31), two grade 7 pupils and the two grade 8 pupils identified the picture of a Roman ship (450 BC) as the oldest, because, as Pearl, grade 7, explained: “it is still made of wood and looks like a tree trunk”. When the interviewer asked her to look at the dates, she responded: “then C [an Egyptian boat from 1900 BC] is the oldest, because thousand before Christ is really a lot”.

The assignments on centuries (32-34) appeared to be problematic for most grade 6-8 pupils. The date 1290 (building of a castle) was correctly interpreted as the 13th century by only one grade 7 pupil. About half of these pupils interpreted 1952 (first TV-broadcast) as 19th century, and 2002 (introduction of the euro) as 20th century.

With regard to the names of eras, grade 5 pupils found some names difficult, as turned out in assignments 15-24, in which they had to place a picture with a little story in one of three given eras. Felicia, for instance, very hesitantly pronounced the names of
‘monniken’ (monks) and ‘revoluties’ (revolutions). The meaning of ‘burgers’ (citizens) and ‘regenten’ (regents) also appeared to be difficult for these pupils. These assignments were skipped for grade 3 and 4 pupils, because they had not learned about these names. However, grade 3-4 pupils, and grade 5 as well, sometimes used traditional names for eras in assignments 1-12, such as ‘Middle Ages’ and ‘time of the knights’ for pictures of a Viking ship (2), a kitchen (7) and a castle (11). For grade 6-8 pupils the names of most eras were familiar, especially when they just had lessons about an era or remembered learning about eras previously. In assignments 15-24, some pupils spontaneously used names of historical eras, such as ‘prehistory’, ‘the time of the Greeks and Romans’, ‘the Middle Ages’, and ‘the time of Monks and Knights’. However, terms such as ‘citizens’, ‘regents’ and ‘holocaust’ appeared to be difficult for these pupils as well. For instance, Mira (grade 6), when answering the assignment about the French Revolution (36) explained: “it says church and nobility and that is the time of regents and princes [1600-1700]”. To the questions of the interviewer if she knew what ‘regents’ are, she answered: “No, but I do know what princes are”. Mike (grade 8) answered in the assignment about the Great Depression (37): “In the time of the world wars and the ho...lo...caust, or something”.

4.4.2 Characteristic features

Pupils hardly reasoned with knowledge of the characteristic features of the ten eras of the Dutch curriculum to place historical phenomena in time. Instead of using the curricular characteristics, pupils often reasoned from the names and icons of the eras. Simon (grade 4) for instance explained that the Golden Age was the time “when they started to make gold”, and Alice (grade 5) remarked: “The Golden Age, those were all very nice years, so that there never can be war”. In the assignment about Columbus (14), Gemma and Theo, grade 5, reasoned that “they had three ships and then they go somewhere to discover something and there [point at the name of the era] it says Discoverers”. The icons with the Greek temple and with the steam factory several times helped pupils to give correct answers in the assignments about a Roman aqueduct (23) and a steam factory (22). As Felicia, grade 5, explained: “this also has poles and it looks a bit like this [points to the pillars of the temple in the icon]” and Alice (grade 5): “this is all steam [pointing at the chimney in the icon] and here it is also steam [pointing at the factory in the picture].

Furthermore, pupils several times mixed up characteristics of different eras. Kai (grade 8), for instance, explained in the assignment on flourishing trade in Amsterdam (39) that “they brought stuff to the cities to barter, so I think it is Cities and States”. Another example is Lucy’s (grade 7) explanation of placing Charlemagne (35) in the era of Cities and States, because: “here in the text it says that he protected the territory of the Pope, and I think cities and states are something like territories”. Pupils sometimes correctly used social and cultural curricular characteristics to explain their answers, such as ‘way of life of hunters and gatherers’ which was mentioned by most pupils from grades 5-8, such as Gemma and Theo in grade 5 in the assignment on reindeer hunters (19):

Gemma: “Then they also hunted animals for food and tents”.
Theo: “Such as deer, hares, wild boars”.

In the assignment about Anne Frank most pupils mentioned ‘the German occupation of the Netherlands and the persecution of Jews’. For instance, Pearl and Lucy (grade 7) explained: “Jews had to hide in the war and when they were caught, they had to go to a camp and there
they had to do all kinds of things and they were separated and so”. Furthermore, some pupils mentioned ‘the cultural flourishing in cities in the Netherlands Republic’ in the assignment about the painting of Vermeer (20), such as Kai (grade 6), who remarked that “in the Golden Age there was a lot of money and then they could buy many more paintings and so on”. However, in the assignments where pupils should have used economic and political characteristic features to place phenomena in one of three eras on a timeline with dates and names of eras (35-40), they often guessed and tried to find clues in the names of eras. For instance, Luke (grade 8), in the assignment about the French Revolution (36), associated the nobility in the story, with the era of Regents and Princes [1600-1700]: “because on the picture you see that they attack a castle and there would be kings and such involved”. Another example is the question about the flourishing trade in sugar, pepper, coffee and tea in Amsterdam (39), to which all grade 7 pupils answered that this was in the era of Cities and States [1000-1500], because, as Lucy (grade 7) explained: “Amsterdam is a city”.

4.4.3 The timeline

In the assignments three different timelines were used: short timelines with three eras with names and icons and without dates in which pictures and little stories had to be placed, full timelines with only dates and three marked timeframes in which a picture had to be placed, and full timelines with dates and names and icons of the ten eras.

Pupils of grade 5 made several mistakes in the assignments in which pictures and little stories about objects or persons had to be placed in one of three eras (15-24). They often made intuitive guesses, as grade 5 pupil Gemma, who, after some thinking, remarked about the photograph of a Roman stadium (17): “This is difficult, I think it is the time of Cities and States, because we just learned about the Greeks and the Romans and then they did not have stadiums at all, so I think it is after that”. However, for some of these assignments they confidently gave correct answers, for example for the photograph of Anne Frank (16), which all pupils recognized and related to the time of the World Wars. Furthermore, most pupils associated the knights of the Bayeux tapestry (18) with the Middle Ages. Grade 6-8 pupils more often could place objects, situations, events or people in the correct era on the timeline.

When asked to relate dates to an era, for the assignments about the timeline without dates, pupils made several mistakes. Kevin (grade 6) for instance explained to a picture of reindeer hunters (19): “Well, prehistory was many millions of years ago and Roman times was a hundred or two hundred year ago”. And Pearl and Lucy, grade 7, mentioned that Columbus (22) sailed to America in the 15th century, since the 11th century was too early, because that was the time of the Romans.

When doubting about the correct answer these pupils often started their reasoning from what they assumed would be the incorrect answers, particularly in the assignments with the timeline with only dates. Mike and Luke (grade 8) reasoned about a 17th century painting of a classroom (25), which they had to place in one of three marked timeframes on the timeline:

Mike: “It cannot be C (around 1900), because now we already have modern classrooms and A (around 700), eh, it was let’s say, the time of the prehistory.”
Luke: [interrupts] “the Middle Ages”.
Mike: “and then they lived in caves. . .”
Chapter 4

The timeline with dates and names and icons of eras (35-40) appeared to give pupils clues for the placement of pictures and stories in an era, as was explained in the previous paragraph.

4.4.4 Compare and contrast

When pupils compared pictures to explain differences between the past and the present, they often showed notions of presentism, by using the words ‘not yet’. This was particularly the case in assignments 1-12 about objects and situations from the past and the present in which pupils used this expression in about one third of their answers. Nora, grade 3, summarized this (1) as she characterized the past as “the time when they did not yet have the things that we have now”. And Mira, grade 6, told that “in the prehistory they did not yet know so much, then they did not even know how to plant something, they had never put seed in the ground, because they had to migrate all the time”. This idea of people getting smarter through history was also expressed by Pearl, grade 7, in the assignment about Columbus (22): “The Romans and the Greeks only thought about Europe and a bit beyond Europe, and in the 15th century they already were a bit smarter and in the 13th century they thought that the earth was a pancake”. Furthermore, when grade 3-5 pupils compared objects, they often looked at the materials and whether there was electricity. In most cases their expressions in these answers also contained notions of presentism in the use of the words ‘not yet’ or ‘still’. For example Ruby, grade 4, told: “in the past they still had wooden cars and such things and no television. And they did not yet have electricity or so”. For the writing devices (5), Nora, grade 3, explained: “and I think this [a slate blackboard] is chalk”, to which Samira added: “they did not yet have a real board [interactive whiteboard] then”.

Pupils of grades 3-5 in particular often mentioned that objects in the present look more beautiful, richer, posh and more real, whereas objects from the past were often characterized as dirty, broken, worn-down, old-fashioned, not familiar, or weird. Nora explained in the assignment about toys (1) that the present Ferrari car “is more beautiful, and those [Victorian doll and car] are all worn down and have scratches”. Paula and Mandy, grade 4, found the Victorian toys “really old-fashioned” and “a bit dirty”, Simon, grade 4, found that “those old cars look really old and also really weird” and Fiona, grade 5, remarked: “I have never seen such a toy in the shop, so that one [a Victorian doll] is from the past”. Grade 6 pupils Kevin and Kai, however, also reasoned that in the times of a 1930’s photo of cars and trams (transport, 10), “they did not have posh cars at all”. And Mike, grade 8, explained in the assignment about the chronological sequence of buildings (11) that the Greek temple had no roof, “so then it is really an old building”.

4.4.5 Sequence

In the sequencing assignments (9-12) pupils of all grades could easily identify the correct sequences of pictures about daily life situations. Moreover, in assignments 1-8 pupils of grades 3-5 even automatically started to explain their answers while constructing chronological sequences. However, their reasoning was often naive with regard to the use of characteristic features and the assumption of progress as described in the previous paragraphs.
Furthermore, pupils regularly mentioned the (lack of) colours in the pictures to justify their answers. Several times pupils mentioned that objects had ‘older colours’, such as a 17th century painting of a classroom (9) and an 18th century painting of a living room (6). For example, Alice, grade 5, reasoned that a 17th century painting of a classroom came first, because “it is still a bit brownish, and there [the other two pictures] they already have colours”. In the sequencing assignments (9-12), the assignment about three living rooms (6) particularly caused discussions, because several pupils doubted which picture would be most long ago: the black-and-white 1960’s photo, or the coloured 18th century painting. For instance, Mandy and Paula, grade 5 answered:

Mandy: “This one, [points at the 1960’s photo], because there are still many people in the living room.”

Paula: “And here everything is black and white [the 1960’s photo] and here [18th century painting] it is not”.

Mandy: “Yes, here it is in colours, and here not yet. So this one is the oldest”.

Simon, grade 4, explained the 1960’s photo: “the television was really weird, because you watched everything in grey-and-white”.

Next to the colours, pupils also took into account if the picture was a drawing, a painting or a photo. In the assignment about the sequence of three women (12) Ruby, grade 4, for instance reasoned: “This [18th century portrait] looks more like a painting and this [20th century photograph] is a real photo”. And in the assignment on classrooms (9), Luke, grade 8, explained that the first picture came first, because it was a painting and the other two were photos.

4.5 CONCLUSIONS AND DISCUSSION

This study aimed to find out which types of problems, related to the objectives of the understanding of time, arise in Dutch primary pupils’ reasoning, while placing objects, situations, events and people in time.

For the first objective, the use of the vocabulary of time, the results confirm findings in previous studies (Levstik & Pappas, 1987; Harnett, 1993; Barton & Levstik 1996; Foster et al., 1999; Hoge & Foster, 2002) that young pupils have problems with the big numbers of dates and that pupils have different interpretations for relative time phrases, which can be problematic, as described by Hodkinson (2003b). Additionally, results showed that pupils found it difficult to reason with dates BC and to relate centuries to dates. Furthermore, pupils did not understand some more abstract names of eras in the Dutch curriculum, such as ‘citizens’ (in the era of Citizens and Steam engines) or ‘regents’ (in the era of Regents and Princes), whereas names of the traditional periodization, such as Middle Ages, appeared to be known.

With regard to the second objective, the use of characteristic features of historical periods, pupils used social and cultural characteristics of the Dutch curriculum only occasionally. Instead of using characteristic features, pupils associated clues in pictures and stories with the names or icons of eras, as for instance for pictures or stories about cities, which regardless of the historical period were associated with the era of Cities and States. As described in previous studies, older pupils more often identified characteristic features than younger pupils (Barton & Levstik, 1996; Foster et al., 1999; Hoge & Foster, 2002). However, this appeared to be more difficult for economic and political than for social and cultural
characteristics. Furthermore, pupils sometimes mixed up characteristics from different historical periods in their reasoning, which relates to ‘fanciful elaborations’ and speculations, as described by VanSledright and Brophy (1992) and Wagenaar and Hemker (2004).

For the third objective, the use of timelines, we found that especially grade 5 pupils made intuitive guesses about the placement of objects, situations, events or people in an era on the timeline. We used different timelines, with and without dates or names and icons of eras. On the timeline without dates, with names and icons, pupils mostly could identify the correct era, but they often guessed about the dates. Placing pictures of objects or events in time appeared to be more difficult on the timeline with only dates, as was also found in the study of De Groot-Reuvekamp et al. (2017). In assignments with a timeline with names and icons of eras, pupils in some cases associated clues in the pictures or stories with the names and icons of the eras that were included in the timeline.

The fourth objective was about comparing and contrasting between historical periods. Our study confirms findings of previous studies that pupils have an idea of linear progression in history and of people becoming smarter through time (Harnett, 1993; Barton & Levstik, 1996; Lee & Ashby, 2001; Hoge & Foster, 2002; Hunt, 2002). In comparing objects, situations and events, pupils many times reasoned that characteristics of present-day society were ‘not yet’ present in earlier periods and that the present is more beautiful, richer, posh and more real. The past, on the other hand, was often characterized as old-fashioned and sometimes as weird.

For the fifth objective, sequencing objects, situations, events and people in chronological order, pupils’ reasoning contained many elements of the previous categories, such as the use of relative time phrase, naive reasoning with characteristic features and the assumption of progress. Furthermore, pupils often reasoned from the type of picture, assuming that drawings and paintings must be older than photos and that pictures with black-and-white, grey and brown colours are older than coloured pictures, which is in line with previous findings (Harnett, 1993; Barton & Levstik, 1996; Foster et al., 1999; Vella, 2001; Blow et al., 2012).

The five objectives on the understanding of historical time appeared to be functional to order the problems in pupils’ reasoning. Building on previous literature, several additional problems were found, with regard to the use of the vocabulary of time, the use of characteristic features of the Dutch ten-era curriculum, the timeline and present-oriented reasoning (Table 4.3). A number of these problems seem to be related to the Dutch curriculum, which was implemented in 2006 to support pupils in their orientation in time (Commission on History and Social Sciences, 2001). The framework of the ten eras and twenty characteristic features adds a new vocabulary to the existing vocabulary of time, whereas the framework of eras in itself is a kind of timeline. In our study the names of the ten eras were partly helpful in the assignments on the placing in time of pictures and stories, because pupils could easily make associations with names such as ‘Romans’, ‘Knights’, ‘Discoverers’, and ‘World Wars’. However, names of eras also hindered pupils in their reasoning, because some names can relate to several eras, as for instance, ‘Farmers’, ‘Cities’ and ‘Princes’. Moreover, pupils found several names difficult to understand, such as ‘Monks’, ‘Regents’, ‘Citizen’s’, ‘Revolutions’ and ‘Holocaust’. The timeline with names and icons of eras seemed to support pupils in placing pictures and stories in time. However, pupils’ reasoning remains rather naive, if the only justification for placing a picture of a factory in the era of Citizens and Steam engines consists of the statement that the factory in the picture looks like the icon that belongs to the era. Besides, relating a phenomenon to an era did not mean that pupils could place the era correctly on the timeline. Furthermore, pupils
hardly used the twenty characteristic features, as mentioned in the Dutch primary school curriculum. One possible explanation could be that a large majority of these features consists of economic and political characteristics, which often are rather abstract for primary school pupils, as was shown in problems in pupils’ answers in assignments 35-40 about economic and political events. Another explanation is that pupils often lacked historical knowledge and did not know what clues would be important in a picture or a story, to place an object, situation, event or person in time.

The fact that this study is part of a larger quantitative study makes that the results can be interpreted as an addition to conclusions of a large-scale test on pupils’ performances on the understanding of historical time, which indicated that pupils’ performances increased through the grades (De Groot-Reuvekamp et al., 2017). Results in the present study also indicate that older pupils encountered less problems than younger pupils, but also that grade 6-8 pupils often had problems with regard to placing phenomena on the timeline, (a lack of) knowledge about characteristic features and present-oriented reasoning.

A limitation of the present study might be the rather small sample of pupils, which implicates that we have to be careful to generalize our conclusions. However, several types of problems that were found confirmed and refined problems that were found in earlier studies. Combined with the additional problems, which related to the Dutch curriculum, the present study gives insights into pupils’ reasoning, which could not have been revealed in a large-scale quantitative study. In future research problems in pupils’ reasoning might be further elaborated on in qualitative studies including more pupils and schools, and in different countries.

Conclusions from the present study indicate that the teaching of historical time in primary school and in teacher training should take into account the problems that are related to the objectives of the understanding of historical time. Pupils should learn how to use the vocabulary of time, how to identify characteristic features of eras and how to place historical phenomena on a timeline. Activities on comparing different eras should not only focus on change, but also on continuity, for instance on phenomena such as agriculture and cities. Furthermore, teachers should be aware of pupils’ perceptions that history is a story of linear progression. Wilschut’s (2012) suggestion for teachers to avoid expressions such as ‘not yet’ and ‘already’ might be helpful to counter present-oriented reasoning. With regard to the names of the ten eras in the Dutch curriculum results of the present study indicate that some names might not be suitable for primary school pupils, because they are too abstract or to little specific. In a future revision of the curriculum this should be taken into account. Another recommendation for Dutch educational policymakers would be to include more concrete social and cultural characteristics in the primary school curriculum.

More research would be needed to investigate if the problems that were found in this study could be tackled with a pedagogy that takes these problems into account. Finally, future research could focus on professionalization of teachers and development of curriculum materials, aimed at improving pupils’ understanding of historical time.
## APPENDIX 4.1

**Ten eras with dates and characteristic features for primary education**

<table>
<thead>
<tr>
<th>Eras</th>
<th>Dates</th>
<th>Characteristic features</th>
</tr>
</thead>
</table>
| 1 Hunters and Farmers       | until 3000 BC | - The way of life of hunters and gatherers.  
- The emergence of agriculture and agricultural communities. |
| 2 Greeks and Romans         | 3000 BC - 500 AD | - The confrontation between Greco-Roman culture and the Germanic cultures of North-West-Europe.  
- Christianity in the Roman Empire: from forbidden to the only allowed religion. |
| 3 Monks and Knights         | 500 - 1000    | - The spread of Christianity to the Low Countries.  
- Feudalism and serfdom. |
| 4 Cities and States         | 1000 – 1500   | - The rise of trade and crafts, and the emergence of cities.  
- The emergence of an urban citizenry and a growing autonomy of cities. |
| 5 Discoverers and Reformers | 1500 – 1600   | - The beginnings of European overseas expansion.  
- The conflict in the Netherlands resulting in the founding of an independent Netherlands State. |
| 6 Regents and Princes       | 1600 – 1700   | - The rise of commercial capitalism and the beginnings of a world economy.  
- Citizens in political power and cultural flourishing in the cities of the Netherlands Republic. |
| 7 Wigs and Revolutions      | 1700 – 1800   | - Slave labour on plantation colonies and the emergence of abolitionism.  
- The striving for fundamental rights and political influence of citizens in the French and Dutch revolutions. |
| 8 Citizens and Steam engines | 1800 – 1900  | - The emergence of a parliamentary system with more and more men and women taking part in the political process.  
- The industrial revolution and the emergence of emancipation movements. |
| 9 World Wars and Holocaust  | 1900 – 1950   | - The crisis of world capitalism.  
- The German occupation of the Netherlands and the persecution of Jews. |
| 10 Television and Computer  | 1950 – until now | - The division of the world into an Eastern and a Western bloc and the Cold War.  
- Social and cultural changes and the growing pluralism from the sixties |
APPENDIX 4.2

SOME EXAMPLES OF THE CODING

Assignment 10: Transport

Interviewer reads the question:
*Here you see means of transport from the past till now. What is the correct sequence in time, starting from the oldest means of transport? Tick the box before the row that represents the correct order in time.*

There are three rows of three pictures from means of transport in different order.
- a horse tram
- a 1930’s city square with cars and trams
- a highway with traffic from the end of the 20th century

<table>
<thead>
<tr>
<th>Answers grade 4, Mandy and Paula</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>After some thinking they select the correct order</td>
<td></td>
</tr>
<tr>
<td>Interviewer: Why do you think this is the correct order?</td>
<td></td>
</tr>
<tr>
<td>Paula: Because, here [A], cars were not yet invented</td>
<td>Presentism: not yet</td>
</tr>
<tr>
<td>Mandy: And the horse walks with a train behind it [laughs]</td>
<td>Presentism: weird</td>
</tr>
<tr>
<td>Paula: And here [B] they had invented cars, but no cars, only busses, and here [C] there are real cars and busses and trucks.</td>
<td>Presentism: real</td>
</tr>
</tbody>
</table>

Assignment 39: Flourishing trade in Amsterdam

Interviewer reads the question:
*From a diary: “The ships in Amsterdam were packed with crates full of sugar, pepper, coffee, and tea. The traders did good business and Amsterdam became very important for our country.” Tick the box for the era in which this was written about Amsterdam.*

There is a timeline with dates and names and icons of eras. Below the timeline there are boxes for three eras:
- A. The era of Cities and States
- B. The era of Regents and Princes
- C. The era of World Wars and Holocaust

<table>
<thead>
<tr>
<th>Answers grade 7, Jessie and Jade</th>
<th>Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jade: I think B, because I don’t think that in time of war you would try very hard to become a trading city.</td>
<td>Timeline:</td>
</tr>
<tr>
<td>Jessie: I think A, the time of cities and states, because they traded a lot in the time of cities and states.</td>
<td>- Start from what they assume would be incorrect, and select the era left over.</td>
</tr>
<tr>
<td>Jade: yes, I also think so.</td>
<td>Lack of knowledge about curricular characteristic features:</td>
</tr>
<tr>
<td></td>
<td>- Mix up characteristic features</td>
</tr>
</tbody>
</table>