
Programmieren mit LOGO

Lösungen

Programmieren im 3. Zyklus nach Lehrplan 21

Hinweis

Dieses Dokument enthält nur Lösungsvorschläge. In vielen Fällen sind andere Lösungen ebenfalls korrekt. Es ist durchaus möglich, dass Aufgaben besser* als hier vorgeschlagen gelöst werden können.

*z.B. sparsamer, sprich mit weniger Code.

Lösungen Einstiegslektion

The grid contains the following shapes in numbered circles:

- ① A square with side length 4 units.
- ② An L-shaped polygon with a vertical side of 4 units and a horizontal side of 2 units.
- ③ A square with side length 4 units.
- ④ Three horizontal lines, each 2 units long, stacked vertically.
- ⑤ A rectangle with a width of 4 units and a height of 2 units.
- ⑥ A staircase shape consisting of three steps, each 1 unit wide and 1 unit high.
- ⑦ A T-shaped polygon with a top horizontal side of 3 units and a vertical stem of 2 units.
- ⑧ Two squares, each with side length 2 units.

Lösungen Einheit 1

1.)

Programm

```
to A1.1
repeat 4 [fd 200 rt 90]
end
```

2.)

Programm

```
to A1.2
bk 200 rt 90 fd 100
end
```

3.)

Programm

```
to A1.3
repeat 2
[fd 200 rt 90 fd 400 rt 90]
end
```

4.)

Programm

```
to A1.4
repeat 4 [fd 100 rt 90]
rt 90 fd 100 lt 90
repeat 4 [fd 100 rt 90]
lt 90 fd 100 rt 90 fd 100
repeat 4 [fd 100 rt 90]
rt 90 fd 100 lt 90
repeat 4 [fd 100 rt 90]
end
```

5.)

Programm

```
to A1.5
repeat 3
[
bk 200 rt 90 fd 100
pu fd 100 lt 90 fd 200 pd
]
end
```

6.)

Programm

```
to A1.6
repeat 4 [fd 100 rt 90]
pu rt 90 fd 150 lt 90 pd
repeat 4 [fd 100 rt 90]
end
```

7.)

Programm

```
to A1.7
bk 200 rt 90 fd 100 lt 90 fd 200
pu rt 90 fd 100 pd
fd 100 bk 100 lt 90
bk 100 rt 90 fd 100 bk 100
lt 90 bk 100
pu rt 90 fd 200 lt 90 pd
repeat 2
[fd 200 rt 90 fd 100 rt 90]
end
```

8.)

Programm

```
to A1.8
bk 200 rt 90 fd 200
lt 135 fd 282
end
```

9.)

Programm

```
to A1.9
repeat 4
[
fd 200 rt 90 fd 1 rt 90 fd 200 rt 90 fd 1 rt 90
fd 200 rt 90
]
end
```

10.)

Programm

```
to A1.10
repeat 3
[
rt 90
fd 100 rt 90 fd 1 rt 90 fd 100
rt 90 fd 1 rt 90
fd 100
lt 90
fd 100 rt 90 fd 1 rt 90 fd 100
rt 90 fd 1 rt 90
fd 100
]
end
```

11.)

Programm

```
to A1.11
repeat 3
[
rt 90
fd 100 rt 90 fd 1 rt 90 fd 100
rt 90 fd 1 rt 90
fd 100
lt 90
fd 100 rt 90 fd 1 rt 90 fd 100
rt 90 fd 1 rt 90
fd 100
]
rt 90 fd 100
repeat 3
```

```
[  
rt 90  
fd 100 rt 90 fd 1 rt 90 fd 100  
rt 90 fd 1 rt 90 fd 100  
lt 90  
fd 100 rt 90 fd 1 rt 90 fd 100  
rt 90 fd 1 rt 90 fd 100  
]  
end
```

12.)

Programm

to A1.12

```
fd 200 rt 90 fd 1 rt 90 fd 200  
rt 90 fd 1 rt 90  
fd 100 rt 90  
fd 100 rt 90 fd 1 rt 90 fd 100  
rt 90 fd 1 rt 90  
fd 100  
lt 90 bk 100  
fd 200 rt 90 fd 1 rt 90 fd 200  
rt 90 fd 1 rt 90
```

pu rt 90 fd 50 lt 90 pd

```
fd 200 rt 90 fd 1 rt 90 fd 200  
rt 90 fd 1 rt 90  
fd 200 rt 90  
fd 100 rt 90 fd 1 rt 90 fd 100  
rt 90 fd 1 rt 90  
fd 100  
rt 90 fd 200 rt 180  
fd 200 rt 90 fd 1 rt 90 fd 200  
rt 90 fd 1 rt 90  
fd 100 lt 90  
fd 100 rt 90 fd 1 rt 90 fd 100  
rt 90 fd 100
```

pu lt 90 fd 50 lt 90 pd

```
fd 200 rt 90 fd 1 rt 90 fd 200  
rt 90 fd 1 rt 90  
rt 90  
fd 100 rt 90 fd 1 rt 90 fd 100  
rt 90 fd 1 rt 90  
fd 100
```

pu fd 50 lt 90 pd

```
fd 200 rt 90 fd 1 rt 90 fd 200
rt 90 fd 1 rt 90
fd 200
rt 90 fd 50 rt 180
fd 100 rt 90 fd 1 rt 90 fd 100
```

end

13.)

Programm

```
to A1.13
repeat 200
[fd 200 rt 90 fd 1 rt 90 fd 200 rt 180]
end
```

14.)

Programm

```
to A1.14
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
fd 100
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
fd 100
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
end
```

15.)

Programm

```
to A1.15
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
repeat 4
[fd 100 rt 90]
fd 100 lt 90 fd 100 rt 90
repeat 4
[fd 100 rt 90]
rt 90 fd 100 lt 90
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
end
```

16.)

Programm

```
to A1.16
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
fd 100
repeat 4
[
fd 100 rt 90 fd 1 rt 90 fd 100 rt 90 fd 1 rt 90
fd 100 rt 90
]
fd 100 rt 90 fd 100 lt 90
repeat 100
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
end
```

17.)

Programm

```
to KREUZE
rt 90
repeat 4
[fd 100 bk 50 lt 90 fd 50 bk 100 fd 50 rt 90 pu fd 100 pd]
end
```

18.)

Programm

```
to QUAD4
repeat 4
[
repeat 4
[fd 50 rt 90]
rt 90 fd 50 pu fd 50 lt 90 pd
]
end
```

19.)

Programm

```
to A1.19
repeat 2
[
repeat 3
[
repeat 4
[fd 50 rt 90]
rt 90 fd 50 lt 90
repeat 50
[fd 50 rt 90 fd 1 rt 90 fd 50 rt 180]
]
]
]

pu lt 90 fd 300 rt 90 bk 50 pd

repeat 3
[
repeat 50
[fd 50 rt 90 fd 1 rt 90 fd 50 rt 180]
repeat 4
[fd 50 rt 90]
rt 90 fd 50 lt 90
]
]

pu lt 90 fd 300 rt 90 bk 50 pd
]

end
```

20.)

Programm

```
to A1.20
repeat 200
[fd 200 rt 90 fd 1 rt 90 fd 200 rt 180]

pu bk 50 lt 90 bk 50 pd

repeat 4
[fd 300 rt 90]

pu rt 90 bk 50 lt 90 bk 50 pd

repeat 4
[
fd 400 rt 90 fd 1 rt 90 fd 400 rt 90 fd 1 rt 90
fd 400 rt 90
]
End
```

21.)

Programm

```
to A1.21
repeat 4
[
repeat 400
[fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]
lt 90
]
end
```

22.)

Programm

```
to A1.22
repeat 4
[
repeat 4
[fd 100 rt 90]
fd 100
rt 30 fd 100 rt 120 fd 100 lt 150
bk 100
pu rt 90 fd 100 lt 90 pd
]

pu lt 90 fd 800 rt 90 bk 300 pd

repeat 4
[
repeat 4
[fd 100 rt 90]
fd 100
rt 30 fd 100 rt 120 fd 100 lt 150
bk 100
pu rt 90 fd 100 lt 90 pd
]

end
```

Lösungen Einheit 2

1.)

Programm

```
to A2.1
repeat 8
[fd 100 rt 360/8]
end
```

2.)

Programm

```
to A2.2
repeat 5
[fd 100 rt 360/5]
end
```

3.)

Programm

```
to A2.3
repeat 12
[fd 100 rt 360/12]
end
```

4.)

Programm

```
to A2.4
repeat 6
[fd 100 rt 360/6]
end
```

5.)

Programm

```
to A2.5
repeat 360
[fd 2 rt 1]
end
```

6.)

Programm

```
to A2.6
repeat 360
[fd 2 rt 1]
pu rt 90 fd 120 lt 90 pd
repeat 360
[fd 2 rt 1]
end
```

7.)

Programm

```
to A2.7
repeat 360
[fd 2 rt 1]
fd 116 rt 90
repeat 4
[fd 230 rt 90]
end
```

8.)

Programm

```
to A2.8
repeat 4
[
fd 200
lt 135
repeat 360 [fd 1 rt 1]
rt 225
]
end
```

9.)

Programm

```
to A2.9
repeat 180
[fd 3 rt 1]
end
```

10.)

Programm

```
to A2.10
repeat 2[repeat 180 [fd 2 rt 1]
fd 120]
end
```

11.)

Programm

```
to A2.11
repeat 3[repeat 180 [fd 1 rt 1]
repeat 180 [fd 1 lt 1]]
end
```

12.)

Programm

```
to A2.12

rt 180 fd 100
repeat 180 [fd 1 lt 1]
fd 100

pu
rt 90 fd 75
pd fd 100 bk 100
rt 90
fd 150 bk 75
lt 90 fd 100

pu
fd 75 lt 90 pd fd 25
repeat 180 [fd 1 rt 1]
fd 50
repeat 180 [fd 1 rt 1]
fd 25
end
```

13.)

Programm

```
to A2.13
setpc 1
repeat 360
[fd 2 rt 1]
end
```

14.)

Programm

```
to A2.14
setpc 4
repeat 360
[fd 2 rt 1]
end
```

15.)

Programm

```
to A2.15
setpc 5
repeat 200
[
fd 200 rt 90 fd 1 rt 90 fd 200 rt 180]
end
```

16.)

Programm

```
to A2.16
setpc 15 repeat 360 [fd 4 rt 1]
setpc 11 repeat 360 [fd 4 lt 1]
end
```

17.)

Programm

```
to A2.17
setpc 3
rt 90
repeat 100 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
end
```

18.)

Programm

```
to A2.18
rt 90
setpc 1
repeat 70 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 7
repeat 70 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 1
repeat 70 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
end
```

19.)

Programm

```
to A2.19
rt 90
setpc 4
repeat 105 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 3
repeat 105 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
end
```

20.)

Programm

```
to A2.20
setpc 11 repeat 100 [fd 200 rt 90 fd 1 rt 90 fd 200 rt 180]
setpc 7 repeat 100 [fd 200 rt 90 fd 1 rt 90 fd 200 rt 180]
setpc 13 repeat 100 [fd 200 rt 90 fd 1 rt 90 fd 200 rt 180]
setpc 0 repeat 2 [fd 200 lt 90 fd 300 lt 90]
end
```

21.)

Programm

```
to A2.21
rt 90
setpc 15
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 12
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 4
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 11
```



```
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 3
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 13
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc 1
repeat 30 [fd 400 rt 90 fd 1 rt 90 fd 400 rt 180]
setpc
0 repeat 2 [fd 400 lt 90 fd 210 lt 90]
end
```

22.)

Programm

```
to A2.22
setpc 1
repeat 300 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
lt 90 fd 185 rt 90 fd 45
setpc 7
repeat 70 [fd 210 rt 90 fd 1 rt 90 fd 210 rt 180]
fd 70 lt 90 bk 70
repeat 70 [fd 210 rt 90 fd 1 rt 90 fd 210 rt 180]
end
```

23.)

Programm

```
to A2.23
setpc 1
repeat 300 [fd 180 rt 90 fd 1 rt 90 fd 180 rt 180]
fd 70 lt 90
setpc 7
repeat 40 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
fd 190 lt 90 bk 70
repeat 40 [fd 180 rt 90 fd 1 rt 90 fd 180 rt 180]
lt 90 fd 33 rt 90
setpc 12
repeat 26 [fd 180 rt 90 fd 1 rt 90 fd 180 rt 180]
fd 77 lt 90 bk 77
repeat 26 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
end
```

24.)

Programm

```
to A2.24
setpc 4
repeat 360 [fd 2 rt 1]
pu
rt 90 fd 260 lt 90
pd
setpc 0
repeat 360 [fd 2 rt 1]
pu
rt 90 fd 260 lt 90
pd
setpc 1
repeat 360 [fd 2 rt 1]
pu
lt 90 fd 385 rt 90 bk 130
pd
setpc 3
repeat 360 [fd 2 rt 1]
pu
rt 90 fd 260 lt 90
pd
setpc 11
repeat 360 [fd 2 rt 1]
end
```

Lösungen Einheit 3

1.)

Programm

```
to A3.1 :SL
repeat 4
[fd :SL rt 90]
end
```

2.)

Programm

```
to A3.2 :S6E
repeat 6
[fd :S6E rt 360/6]
end
```

3.)

Programm

```
to A3.3 :SXE
repeat :SXE
[fd 100 rt 360/:SXE]
end
```

4.)

Programm

```
to A3.4 :FDK
repeat 360
[fd :FDK rt 1]
end
```

5.)

Programm

```
to A4.5 :LDL
fd :LDL
rt 90 fd 1 rt 90
fd :LDL
rt 180
end
```

6.)

Programm

```
to A4.6 :AQ
repeat :AQ
[
repeat 4 [fd 30 rt 90]
rt 90 fd 30 lt 90
]
end
```

7.)

Programm

```
to A3.7 :DS
rt 30
repeat 3
[fd :DS rt 120]
end
```

8.)

Programm

```
to A3.8 :BB :LL
repeat 2 [fd :BB rt 90 fd :LL rt 90]
end
```

9.)

Programm

```
to A3.9 :XKRA :FFDD
repeat :XKRA
[
repeat 360
[fd :FFDD rt 1]
pu
rt 90 fd 170 lt 90
pd
]
end
```

10.)

Programm

```
to A3.10 :FARB :BBBB :LLLL
setpc :FARB
repeat :LLLL
[fd :BBBB rt 90 fd 1 rt 90 fd :BBBB rt 180]
end
```

11.)

Programm

```
to A3.11 :F1 :F2 :F3
rt 90
setpc :F1
repeat 60 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
setpc :F2
repeat 60 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
setpc :F3
repeat 60 [fd 300 rt 90 fd 1 rt 90 fd 300 rt 180]
setpc 0
repeat 2 [fd 300 lt 90 fd 180 lt 90]
end
```

12.)

Programm 1

```
to A3.12
repeat 4
[
repeat 4
[
setpc 0 repeat 50 [fd 50 rt 90 fd 1 rt 90 fd 50 rt 180]
setpc 7 repeat 50 [fd 50 rt 90 fd 1 rt 90 fd 50 rt 180]
]
pu bk 50 lt 90 fd 50*8 rt 90 pd
repeat 4
[
setpc 7 repeat 50 [fd 50 rt 90 fd 1 rt 90 fd 50 rt 180]
setpc 0 repeat 50 [fd 50 rt 90 fd 1 rt 90 fd 50 rt 180]
]
pu bk 50 lt 90 fd 50*8 rt 90 pd
]
pu fd 50 pd
setpc 0 repeat 4 [fd 50*8 rt 90]
end
```

Programm 2

```
to A3.12 :SSL :SFAR1 :SFAR2
repeat 4
[
repeat 4
[
setpc :SFAR1 repeat :SSL [fd :SSL rt 90 fd 1 rt 90 fd :SSL rt 180]
setpc :SFAR2 repeat :SSL [fd :SSL rt 90 fd 1 rt 90 fd :SSL rt 180]
]
pu bk :SSL lt 90 fd :SSL*8 rt 90 pd
repeat 4
[
setpc :SFAR2 repeat :SSL [fd :SSL rt 90 fd 1 rt 90 fd :SSL rt 180]
setpc :SFAR1 repeat :SSL [fd :SSL rt 90 fd 1 rt 90 fd :SSL rt 180]
]
pu bk :SSL lt 90 fd :SSL*8 rt 90 pd
]
pu fd :SSL pd
setpc 0 repeat 4 [fd :SSL*8 rt 90]
end
```

Lösungen Einheit 4

1.)

Unterprogramm

```
to QUADRAT100  
repeat 4 [fd 100 rt 90]  
end
```

Unterprogramm

```
to NP1  
rt 90 fd 100 lt 90  
end
```

Programm

```
to A4.1  
repeat 5 [QUADRAT100 NP1]  
end
```

2.)

Unterprogramm

```
to TreppStu  
fd 100 rt 90 fd 100 lt 90  
end
```

Programm

```
to A4.2  
repeat 4 [TreppStu]  
end
```

3.)

Unterprogramm

```
to NP2  
fd 100  
end
```

Unterprogramm

```
to aQUA100  
repeat 100 [fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]  
end
```

Programm

```
to A4.3  
repeat 4 [aQUA100 NP2]  
end
```

4.)

Unterprogramm

```
to QUADRAT100  
repeat 4 [fd 100 rt 90]  
end
```

Unterprogramm

```
to aQUA100  
repeat 100 [fd 100 rt 90 fd 1 rt 90 fd 100 rt 180]  
end
```

Unterprogramm

```
to NP1  
rt 90 fd 100 lt 90  
end
```

Programm

```
to A4.4  
repeat 3 [aQUA100 QUADRAT100 NP1]  
end
```

5.)

Unterprogramm

```
to KREIS2  
repeat 360 [fd 2 rt 1]  
end
```


Programm

```
to A4.5  
repeat 9 [KREIS2 rt 360/9]  
end
```

6.)

Unterprogramm

```
to KREIS2  
repeat 360 [fd 2 rt 1]  
end
```

Programm

```
to A4.6  
repeat 24 [KREIS2 rt 360/24]  
end
```

7.)

Unterprogramm

```
to KREIS2  
repeat 360 [fd 2 rt 1]  
end
```

Programm

```
to A4.7 :AB  
repeat :AB [KREIS2 rt 360/:AB]  
end
```

8.)

Unterprogramm

```
to KREISF1  
setpc 1 repeat 360 [fd 2 rt 1]  
end
```

Unterprogramm

```
to KREISF2  
setpc 12 repeat 360 [fd 2 rt 1]  
end
```

Programm

```
to A4.8
repeat 10
[
KREISF1
rt 360/20
KREISF2
rt 360/20
]
end
```

9.)

Vereinfachtes Programm

```
to BLATT
repeat 2 [repeat 120 [fd 2 rt 1] rt 60]
end
```

10.)

Unterprogramm

```
to BLATT
repeat 2 [repeat 120 [fd 2 rt 1] rt 60]
end
```

Programm

```
to A4.10
repeat 12 [BLATT rt 360/12]
end
```

11.)

Unterprogramm

```
to hbBLATT
setpc 6
repeat 2 [repeat 120 [fd 2 rt 1] rt 60]
end
```

Unterprogramm

```
to hgBLATT
setpc 11
repeat 2 [repeat 120 [fd 2 rt 1] rt 60]
end
```

Programm

```
to A4.11  
repeat 15 [hgBLATT rt 360/30 hbBLATT rt 360/30]  
end
```

12.)

Unterprogramm

```
to freiBLATT :GRO  
repeat 2 [repeat 120 [fd :GRO rt 1] rt 60]  
end
```

Programm

```
to A4.12 :GRO :ANZ  
repeat :ANZ [freiBLATT :GRO rt 360/:ANZ]  
end
```

Lösungen Einheit 5

1.)

Unterprogramm

```
to QUADRAT100
repeat 4 [fd 100 rt 90]
end
```

Programm

```
to A5.1
repeat 20
[
QUADRAT100 wait 4 pe QUADRAT100 ppt
pu rt 90 fd 50 lt 90 pd
]
end
```

2.)

Unterprogramm

```
to KR2
repeat 360 [fd 2 rt 1]
end
```

Programm

```
to A5.2
pu fd 300 pd
repeat 20
[
KR2 wait 4 pe KR2 ppt
pu bk 50 pd
]
end
```

3.)

Unterprogramm

```
to DE
rt 30
repeat 3 [fd 200 rt 120]
lt 30
end
```

Programm

```
to A5.3
pu rt 90 fd 500 lt 90 pd
repeat 30
[
DE wait 4 pe DE ppt
pu lt 90 fd 50 rt 90 pd
]
end
```

4.)

Programm

```
to A5.4
repeat 30 [StriM wait 4 pe StriM ppt pu rt 90 fd 50 lt 90 pd]
end
```

5.)

Unterprogramm

```
to BLR
lt 30 fd 100 rt 120
fd 400 rt 120 fd 100 rt 60 fd 300
bk 300 rt 120 fd 100
lt 120 fd 100 rt 45 fd 250
lt 135 fd 176
rt 90 fd 124
rt 60 bk 100
rt 30
end
```

Unterprogramm

```
to BRL
lt 30 fd 100 rt 120
fd 400 rt 120 fd 100 rt 60 fd 300
bk 300 rt 120 fd 100
lt 120 fd 100
rt 90 fd 176 lt 135 fd 249
rt 45 fd 124 rt 60 bk 100
rt 30
end
```

Programm

```
to A5.5
pu lt 90 fd 700 rt 90 pd
repeat 25
[
BLR wait 4 pe BLR ppt
pu rt 90 fd 50 lt 90 pd
]
repeat 25
[
BRL wait 4 pe BRL ppt
pu lt 90 fd 50 rt 90 pd
]
end
```

6.)

Unterprogramm

```
to sQU
repeat 200
[
fd 200 rt 90 fd 1 rt 90 fd 200 rt 180
]
end
```

Programm

```
to A5.6
pu lt 90 fd 600 rt 90 pd
sQU
repeat 600
[
pu lt 90 fd 200 rt 90 pd
pe fd 200 rt 90 fd 1 rt 90 fd 200 rt 180 ppt
pu rt 90 fd 200 lt 90 pd
fd 200 rt 90 fd 1 rt 90 fd 200 rt 180
]
end
```

7.)

Unterprogramm

```
to KREIS
repeat 360 [fd 0.5 rt 1]
end
```

Programm

```
to A5.7
repeat 360
[
setpc 2 KREIS wait 1 pe KREIS ppt
pu fd 4 rt 1 setpc 2 pd
]
end
```

8.)

Unterprogramm

```
to freiQUA :SQ
repeat 4 [fd :SQ rt 90]
end
```

Unterprogramm

```
to UP8 :SQ
freiQUA :SQ wait 4 pe freiQUA :SQ ppt
pu fd 30 pd
end
```

Programm

```
to A5.8 :SQ
pu lt 90 fd 600 rt 90 pd
rt 45
repeat 3
[
repeat 10
[UP8 :SQ]
rt 90
repeat 10
[UP8 :SQ]
lt 90
]
end
```

9.)

Unterprogramm

```
to SONNE
repeat 45 [fd 16 rt 8]
end
```

Unterprogramm

```
to ERDE
repeat 45 [fd 2 rt 8]
end
```

Programm

```
to A5.9
setpc 3 SONNE
pe
lt 180 fd 220 lt 90 fd 105 lt 180
ppt
repeat 72 [setpc 4 ERDE wait 10 pe ERDE rt 5 fd 20 ppt]
end
```

10.)

Unterprogramm

```
to BALL
repeat 60
[fd 2 rt 6]
end
```

Programm

```
to A5.10
pu rt 90 fd 500 lt 90 pd
TOR
pu fd 1200 rt 90 rt 77 pd
repeat 43
[setpc 11 BALL wait 3 pe BALL ppt pu fd 30 pd]
end
```

11.)

Unterprogramm

```
to BALL2
repeat 60
  [fd 5 rt 6]
end
```

Programm

```
to A5.11
pu bk 300 lt 90 fd 700 rt 180 pd
fd 1400
pu lt 90 fd 647 lt 90 fd 700 rt 90 pd
repeat 20
[BALL2 wait 4 pe BALL2 ppt pu bk 30 pd]
repeat 15
[BALL2 wait 4 pe BALL2 ppt pu fd 30 pd]
repeat 15
[BALL2 wait 4 pe BALL2 ppt pu bk 30 pd]
repeat 10
[BALL2 wait 4 pe BALL2 ppt pu fd 30 pd]
repeat 10
[BALL2 wait 4 pe BALL2 ppt pu bk 30 pd]
repeat 5
[BALL2 wait 8 pe BALL2 ppt pu fd 30 pd]
repeat 5
[BALL2 wait 8 pe BALL2 ppt pu bk 30 pd]
repeat 2
[BALL2 wait 8 pe BALL2 ppt pu fd 30 pd]
repeat 2
[BALL2 wait 12 pe BALL2 ppt pu bk 30 pd]
BALL2
end
```

Lösungen Einheit 6

1.)

Unterprogramm

```
to freiQUA :SL
repeat 4 [fd :SL rt 90]
end
```

Programm

```
to A6.1 :SL
repeat 7 [freiQUA :SL make "SL :SL+40]
end
```

2.)

Unterprogramm

```
to freiQUA :SL
repeat 4 [fd :SL rt 90]
end
```

Programm

```
to A6.2 :SL :AQ
repeat :AQ [freiQUA :SL make "SL :SL+40]
end
```

3.)

Unterprogramm

```
to GSD :SLD
rt 30
repeat 3 [fd :SLD rt 120]
lt 30
end
```

Programm

```
to A6.3 :SLD
repeat 5 [GSD :SLD make "SLD :SLD+100]
end
```

4.)

Unterprogramm

```
to GSD :SLD
rt 30
repeat 3 [fd :SLD rt 120]
lt 30
end
```

Programm

```
to A6.4 :SLD :AD
repeat :AD [GSD :SLD make "SLD :SLD+100]
end
```

5.)

Unterprogramm

```
to HK :F
repeat 180 [fd :F rt 1]
end
```

Unterprogramm

```
to A6.5 :F
repeat 5 [HK :F rt 180 make "F :F/2]
end
```

Programm

6.)

Unterprogramm

```
to HK :F
repeat 180 [fd :F rt 1]
end
```

Programm

```
to A6.6 :F :AHK
repeat :AHK [HK :F rt 180 make "F :F/2]
end
```

7.)

Unterprogramm

```
to HKR :F
repeat 180 [fd :F rt 1]
end
```

Unterprogramm

```
to HKL :F
repeat 180 [fd :F lt 1]
end
```

Programm

```
to A6.7 :F
repeat 4 [HKR :F make "F 4*:F/5 HKL :F make "F 4*:F/5]
end
```

8.)

Programm

```
to A6.8 :L
repeat 6 [repeat 2 [fd :L rt 90] make "L :L +40]
end
```

9.)

Programm

```
to A6.9 :L :AE
repeat :AE [repeat 2 [fd :L rt 90] make "L :L +40]
end
```

10.)

Unterprogramm

```
to RE :RS
repeat 2 [fd :RS/4 rt 90 fd :RS rt 90]
end
```

Programm

```
to A6.10 :RS
repeat 10 [RE :RS rt 90 fd :RS lt 90 fd :RS/4 lt 90 make "RS 3*:RS/4]
end
```

11.)

Unterprogramm

```
to BLATT
repeat 2 [repeat 120 [fd 1 rt 1] rt 60]
end
```

Programm

```
to A6.11 :AnzB :FAR :BLU
pu lt 90 fd 600 rt 90 pd
repeat :BLU
[
setpc :FAR
repeat :AnzB [BLATT rt 360/:AnzB]
make "AnzB :AnzB+1
make "FAR :FAR+1
pu rt 90 fd 200 lt 90 pd
]
end
```

Lösungen Einheit 7

1.)

Unterprogramm

```
to KREIS
repeat 360 [fd 3 rt 1]
end
```

Unterprogramm

```
to DREIECK
rt 30
repeat 3 [fd 400 rt 120]
lt 30
end
```

Unterprogramm

```
to QUADRAT
repeat 4 [fd 300 rt 90]
end
```

Programm

```
to A7.1 :WAS
if :WAS=1 [KREIS] []
if :WAS=2 [DREIECK] []
if :WAS=3 [QUADRAT] []
end
```

2.)

Unterprogramm

Siehe Aufgabe 1

Programm

```
to A7.2 :WAS
if :WAS=1 [KREIS] []
if :WAS=2 [DREIECK] []
if :WAS=3 [QUADRAT] []
if :WAS<1 [pr [Gib eine Zahl zwischen 1 und 3 ein]] []
if :WAS>3 [pr [Gib eine Zahl zwischen 1 und 3 ein]] []
end
```

3.)

Unterprogramm

```
to freiQUA :SQ
repeat 4 [fd :SQ rt 90]
end
```

Programm

```
to A7.3 :SQ
repeat 20
[
freiQUA :SQ
make "SQ :SQ+50
if :SQ>500 [stop] []
]
end
```

4.)

Unterprogramm

```
to aQUA
repeat 200
[
fd 200 rt 90 fd 1 rt 90 fd 200 rt 180
]
end
```

Programm

```
to A7.4 :FARBE
repeat 16
[
setpc :FARBE
aQUA
wait 30
pu lt 90 fd 200 rt 90 pd
make "FARBE :FARBE+1
if :FARBE=7 [make "FARBE :FARBE+1] []
]
end
```

5.)

Unterprogramm

```
to GSD :SD
rt 30
repeat 3 [fd :SD rt 120]
lt 30
end
```

Programm

```
to A7.5 :SD
pu lt 90 fd 500 rt 90 pd
repeat 50
[
GSD :SD
make "SD :SD+50
if :SD>300 [pu rt 90 fd 350 lt 90 pd make "SD :SD-280] []
]
end
```

6.)

Unterprogramm

```
to freiQUA :SQ
repeat 4 [fd :SQ rt 90]
end
```

Programm

```
to A7.6 :SQ
pu bk 300 lt 90 fd 400 rt 90 pd
repeat 20
[
freiQUA :SQ
pu rt 90 fd :SQ lt 90 fd :SQ pd
make "SQ :SQ-30
if :SQ<20 [stop] []
]
end
```

7.)

Unterprogramm

```
to freiKREIS :FD :FAR
setpc :FAR
repeat 360 [fd :FD rt 1]
end
```

Programm

```
to A7.7 :FD :FAR
pu bk 200 lt 90 fd 600 rt 90 pu
repeat 40
[
freiKREIS :FD :FAR
make "FD :FD+0.5
if :FD>3 [pu rt 90 fd 350 lt 90 pd make "FD :FD-2.5 make "FAR :FAR+1] []
]
end
```

Warum die Schildkörte zuerst mit rot malt und nicht mit schwarz ist dem Autoren dieser Unterrichtsreihe selber nicht klar. Er lernt aber gerne von Schülerinnen/Schülern und Lehrpersonen ;-) Kontakt: matthias.dudli@phsg.ch

8.)

Programm

```
to MEGASTÄDTE :STADT
if :STADT<1 [pr [ungültige Eingabe]] []
if :STADT>10 [pr [ungültige Eingabe]] []
if :STADT=1 [pr [Tokio (ca. 37.8 Mio Einwohner)]] []
if :STADT=2 [pr [Jakarta (ca. 31.3 Mio Einwohner)]] []
if :STADT=3 [pr [Delhi (ca. 25.7 Mio Einwohner)]] []
if :STADT=4 [pr [Seoul (ca. 23.6 Mio Einwohner)]] []
if :STADT=5 [pr [Manila (ca. 22.9 Mio Einwohner)]] []
if :STADT=6 [pr [Mumbai (ca. 22.9 Mio Einwohner)]] []
if :STADT=7 [pr [Karatschi (ca. 22.9 Mio Einwohner)]] []
if :STADT=8 [pr [Shanghai (ca. 22.7 Mio Einwohner)]] []
if :STADT=9 [pr [New York (ca. 20.7 Mio Einwohner)]] []
if :STADT=10 [pr [Sao Paulo (ca. 20.6 Mio Einwohner)]] []
end
```

9.)

Unterprogramm

```
to BLATT :COL
setpc :COL
repeat 2 [repeat 120 [fd 0.5 rt 1] rt 60]
end
```

Programm

```
to A7.9 :ANZ :COL
pu lt 90 fd 500 rt 90 pd
repeat 20
[
repeat :ANZ [BLATT :COL rt 360/:ANZ]
pu rt 90 fd 100 lt 90 pd
make "ANZ :ANZ+1
make "COL :COL+1
if :ANZ>11 [stop] []
]
end
```

10.)

Individuelle Lösung

11.)

Individuelle Lösung
