W3C XML Schemas For Publishing

```
<?xml version="1.0" encoding="UTF-8"?>
<procedure xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="ex_5.8.xsd">
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research and Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
      The Larken 2424 CNC Router is a high-speed computer-controlled
      woodworking tool.  It was purchased new in 2004 and was fully
      lubricated when purchased.  The need for further lubrication
      depends on the number of hours of use as well as the elapsed
      calendar time.  With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be less than 18 months).

      Each of the three screw drives should be lubricated with a dry
      Teflon spray. Do not use any wet lubricants, as they will
      attract dust and cause fouling.  Before applying the lubricant,
      remove dust from screw mechanisms using compressed air
```

```
        and a clean brush.
   </abstract>
</procedure>
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" >

<xs:element name="procedure">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="title" type="xs:string"/>
      <xs:element name="author" type="xs:string"/>
      <xs:element name="department" type="xs:string"/>
      <xs:element name="revisionDate" type="xs:date"/>
      <xs:element name="abstract" type="xs:string"/>
    </xs:sequence>
  </xs:complexType>
</xs:element>

</xs:schema>
```

- In this example, all types are defined locally.

- Note that the type of the `revisionDate` element is `xs:date`.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<procedure xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="ex_5.9.xsd">
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research &amp; Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
    <paragraph>
      The Larken&#174; 2424 CNC Router is a high-speed
      computer-controlled woodworking tool.  It was purchased
      new in 2004 and was fully lubricated when purchased.
      The need for further lubrication depends on the number
      of hours of use as well as the elapsed calendar time.
      With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be &lt; 18 months).
    </paragraph>
    <paragraph>
      Each of the three screw drives should be lubricated with a dry
```

```
         Teflon spray. Do not use any wet lubricants, as they will
         attract dust and cause fouling.  Before applying the lubricant,
         remove dust from screw mechanisms using compressed air
         and a clean brush.
      </paragraph>
   </abstract>
   <details>
      The detailed procedure will go right here!
   </details>
</procedure>
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" >

<xs:element name="procedure">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="title" type="xs:string"/>
      <xs:element name="author" type="xs:string"/>
      <xs:element name="department" type="xs:string"/>
      <xs:element name="revisionDate" type="xs:date"/>
      <xs:element name="abstract">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="paragraph" type="xs:string"
              minOccurs="1" maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="details" type="xs:string"/>
    </xs:sequence>
```

```
    </xs:complexType>
</xs:element>

</xs:schema>
```

- In this example, all types can still be defined locally.

- General entities and character references have no counterpart in the W3C Schema.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<procedure xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="ex_5.10.xsd">
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research &amp; Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
    <paragraph>
      The <equipment>Larken&#174; 2424 CNC Router</equipment>
      is a high-speed computer-controlled
      woodworking tool.  It was purchased new in 2004 and was fully
      lubricated when purchased.  The need for further lubrication
      depends on the number of hours of use as well as the elapsed
      calendar time.  With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be &lt; 18 months).
    </paragraph>
    <paragraph>
      Each of the three screw drives should be lubricated with a dry
```

```
        <supply>Teflon spray</supply>. Do not use any wet lubricants,
         as they will
        attract dust and cause fouling.  Before applying the lubricant,
        remove dust from screw mechanisms using compressed air
        and a clean brush.
      </paragraph>
    </abstract>
    <details>
      The detailed procedure will go right here!
    </details>
</procedure>
```

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" >

<xs:element name="procedure">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="title" type="xs:string"/>
      <xs:element name="author" type="xs:string"/>
      <xs:element name="department" type="xs:string"/>
      <xs:element name="revisionDate" type="xs:date"/>
      <xs:element name="abstract">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="paragraph" type="ParagraphType"
              minOccurs="1" maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="details" type="xs:string"/>
    </xs:sequence>
```

```
    </xs:complexType>
</xs:element>

<xs:complexType name="ParagraphType" mixed="true">
  <xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:element name="equipment" type="xs:string"/>
    <xs:element name="supply" type="xs:string"/>
  </xs:choice>
</xs:complexType>

</xs:schema>
```

- `ParagraphType` is defined at the global level.

- The definition for `ParagraphType` includes the attribute `mixed="true"` to allow mixed content.

- The `xs:choice` element is used to make the modifying elements optional within the running text of the `paragraph` element.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<procedure xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="ex_5.11.xsd">
  <title>CNC Router Lubrication</title>
  <author>Don Wallace</author>
  <department>Research &amp; Development</department>
  <revisionDate>2006-04-01</revisionDate>
  <abstract>
    <paragraph>
      The <equipment>Larken&#174; 2424 CNC Router</equipment>
      is a high-speed computer-controlled
      woodworking tool.  It was purchased new in 2004 and was fully
      lubricated when purchased.  The need for further lubrication
      depends on the number of hours of use as well as the elapsed
      calendar time.  With heavy usage, the machine should be
      lubricated every 9 months (lubrication interval should always
      be &lt; 18 months).
    </paragraph>
    <paragraph>
      Each of the three screw drives should be lubricated with a dry
```

```xml
      <supply>Teflon spray</supply>. Do not use any wet lubricants,
       as they will
      attract dust and cause fouling.  Before applying the lubricant,
      remove dust from screw mechanisms using compressed air
      and a clean brush.
    </paragraph>
</abstract>
<details>
  <frequency>Every 9 to 18 months</frequency>
  <duration>1 hour</duration>
  <steps>
    <step name="Determine Need for Lubrication">
      <paragraph>Follow the schedule defined elsewhere in
      this procedure.  If the machine should start to make a
      persistent squeaking or howling noise, lubricate the screw
      mechanism causing the noise immediately.</paragraph>
    </step>
    <step name="Procure Supplies">
      <paragraph>Use only dry <supply>Teflon spray</supply>.
      </paragraph>
```

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      </step>
      <step name="Clean Machine First">
        <paragraph>Using the shop vac or a fine brush, remove any
        dust or chips from all parts of the router.  Pay particular
        attention to removing dust from each screw
        mechanism.</paragraph>
        <paragraph>Take special care not to damage the threads of
        a screw mechanism while cleaning.  <warning>Do not use
        any liquid or spray cleaners.</warning>
        </paragraph>
      </step>
      <step name="Apply Lubricant">
        <paragraph>Spray each screw mechanism lightly with the
        lubricant.  Clean any overspray off of visible machine parts
        using a soft damp cloth.</paragraph>
      </step>
    </steps>
  </details>
</procedure>
```

```xml
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" >

<xs:element name="procedure">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="title" type="xs:string"/>
      <xs:element name="author" type="xs:string"/>
      <xs:element name="department" type="xs:string"/>
      <xs:element name="revisionDate" type="xs:date"/>
      <xs:element name="abstract">
        <xs:complexType>
          <xs:sequence>
            <xs:element name="paragraph" type="ParagraphType"
             minOccurs="1" maxOccurs="unbounded"/>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
      <xs:element name="details" type="DetailsType"/>
    </xs:sequence>
```

```
    </xs:complexType>
</xs:element>

<xs:complexType name="ParagraphType" mixed="true">
  <xs:choice minOccurs="0" maxOccurs="unbounded">
    <xs:element name="equipment" type="xs:string"/>
    <xs:element name="supply" type="xs:string"/>
    <xs:element name="warning" type="xs:string"/>
  </xs:choice>
</xs:complexType>

<xs:complexType name="DetailsType">
  <xs:sequence>
    <xs:element name="frequency" type="xs:string"/>
    <xs:element name="duration" type="xs:string"/>
    <xs:element name="steps">
      <xs:complexType>
        <xs:sequence>
          <xs:element name="step" type="StepType"
            minOccurs="1" maxOccurs="unbounded"/>
```

```
      </xs:sequence>
    </xs:complexType>
  </xs:element>
 </xs:sequence>
</xs:complexType>


<xs:complexType name="StepType">
  <xs:sequence>
    <xs:element name="paragraph" type="ParagraphType"
      minOccurs="1" maxOccurs="unbounded"/>
  </xs:sequence>
  <xs:attribute name="name" type="xs:string"/>
</xs:complexType>

</xs:schema>
```

- The global type definition `ParagraphType` is reused in the definition of `StepType`.

More About Builtin Types

String-Based Types

- `string`, `normalizedString` and `token`

- `Name`

- `NCName`

- `language`

Numeric Types

- `float` and `double`

- `decimal`

- `integer`

Date & Time Types

- `date`

- `dateTime`

- `gYear`

- `gYearMonth`

- `gMonth`

- `gMonthDay`

- `gDay`

- `duration`

- `ID`

- `IDREF`

- `IDREFS`

- `ENTITY`

- `ENTITIES`

- `NMTOKEN`

- `NMTOKENS`

- `NOTATION`

- `QName`

- `boolean`

- `hexBinary` and `base64Binary`

- `anyURI`

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